

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

SERIES 3

VOLUME II

1928

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SERIES 3. VOL. II

APRIL 14, 1928

NO. 1

Forsythias or Goldenbells make the season's first brave display of yellow blossoms and without these handsome shrubs spring gardens would lose much of their beauty. The genus is an Old World one and its distribution is quite interesting. For many years two species only were known, both native of eastern China and cultivated in Japan. In 1897 a species was discovered on the mountains of Albania in southeastern Europe. Since then another species has been discovered in China, one in west Japan and one on the Diamond Mountains of Korea. It is really an Oriental genus with one outlying species in the Balkan Peninsula and geographically far removed. Among shrubs we know of no other identical case but a close parallel is found in the related Lilacs and Privets, which, in addition to Oriental and European species, have representatives on the Himalayas. In very severe winters the flower buds are apt to suffer more or less severely, but on the whole all Forsythias may be classed as hardy so far north as Boston. Formerly the Cornelian Cherry (*Cornus mas*) the Leatherwood (*Dirca palustris*) and the Spicebush (*Benzoin aestivale*) were the season's first favorites among yellow flowering woody plants, but for ornamental purposes Forsythias have now entirely superseded them. The Forsythias are admirable subjects for planting either on banks, against walls or fences, for hedges, or as specimens, but one of the tragedies of spring is the brutal way in which these good-natured shrubs are clipped and sheared at the annual tidying up of the garden. As one travels through the suburbs and countryside decapitated bushes of Forsythias are to be seen on either hand despite the obvious fact that every branch cut from them in early April means a loss of flowers. If people would only wait and enjoy the crop of blossoms and then cut the Forsythia bushes back as severely as circumstances or fancy dictates, no harm would be done. Like other spring flowering shrubs and trees Forsythias produce their blossoms on the past season's growth and the pruning of all these plants should be done immediately after the blossoms have fallen. It is surprisingly difficult to get people to appreciate or at least to practise this simple fact.

In the Arboretum the collection is established on a steep bank on Bussey Hill Road near Forest Hills Gate and immediately before the Lilacs are reached. Individual bushes of the species and varieties are at the lower end and beyond is a tangle some 75 yards long and 25 yards deep, which is one of the most spectacular sights of early spring in the Arboretum. In the Shrub Garden certain of the older species, hybrids and varieties are grown. The curious may be interested to note that in the flowers of the *Forsythia* the style of the pistil is of two lengths. On some bushes the flowers all have a style longer than the stamens and reaching to the mouth of the corolla-tube. On other plants the style is short reaching about half the length of the corolla-tube and the stamens protrude above it. Some of the varieties of the hybrid *F. intermedia* are distinguished by having either a long or short style to the pistil. Of the six species known all except *F. Giraladiana* from Shensi province in China are cultivated in the Arboretum. This species is described as having hairs on the leaves, a condition found in *F. suspensa* var. *pubescens*, which is growing in the Arboretum. It is rather interesting to note that in the allied genera *Syringa*, *Fraxinus* and *Chionanthus* hairiness may occur in any species. It would appear that pubescence in these genera is a family peculiarity and of little or no taxonomic significance.

Forsythia ovata, a newcomer from the Diamond Mountains in Korea, whence it was introduced by the Arnold Arboretum through seeds sent by E. H. Wilson in 1917, is first of the *Forsythias* to open its blossoms. In a wild state this is a straggling, often sprawling shrub of no great size, remarkable chiefly for its relatively large, dark green, very leathery leaves. In cultivation it is a sparsely branching, vigorous shrub with ascending, arching stems forming a broad, rounded shrub some 5 to 7 feet tall. The shoots are pale gray and this with its habit of growth readily distinguish it from other species. The leaves are thick and leathery, broadly ovate, from 2 to 3 inches long and from 1½ to 2 inches wide, coarsely-toothed, and lustrous dark green on the upper surface. The flowers, borne singly or in pairs, are each about 1 inch across and have a purple-brown calyx and a pale, rather greenish, yellow corolla. Though the flowers are smaller than those of other species and the color somewhat pale this new species, on account of its great hardiness, is likely to be of great value to northern gardens. It will probably prove hardy as far north as Ottawa and the hybridist should find it of much service.

Forsythia suspensa, native of China but for centuries grown in Japanese gardens and from there introduced into Holland in 1833, was the first *Forsythia* to be known. The typical form has long, whip-like branchlets, pendent or sprawling on the ground, where they root freely. It will grow from 15 to 30 feet tall and on account of its lax habit this is the best *Forsythia* for planting against walls or fences or for training over pergolas. The variety *Fortunei* is an upright growing bush of vigorous habit with erect and arching branches and abundant golden yellow blossoms. Another variety



The best Goldenbell (*Forsythia intermedia* var. *spectabilis*)

(*atrocaulis*) introduced from central China in 1907 is remarkable for its blackish purple shoots and extremely large flowers; unfortunately this does not blossom so freely as the type.

Forsythia viridissima was the second species introduced, being sent to England from China by Robert Fortune in 1844. This is a bush with ascending-spreading stems some 5 to 6 feet tall and bright yellow flowers. It is not so hardy as *F. suspensa* and blossoms a little later. More handsome than the type and likely to be of greater hardiness is the variety *koreana*, a common plant in the neighborhood of Seoul, the capital of Korea. This has spreading, arching branches and deeper yellow, more abundant blossoms than the Chinese type. It was introduced by the Arboretum in 1919 through seeds received from the Department of Forestry in Korea. These two Chinese species are much confused in gardens but may be readily distinguished one from the other by splitting a shoot down the middle. In *F. viridissima* the pith will be seen to be arranged in plates one above another, whereas in *F. suspensa* there is no pith and the center of the stem is hollow. Interestingly enough the hybrid between these two species, *F. intermedia*, partakes of both characters. In some shoots or parts of the same shoot lamellate pith will be seen, whereas in others no pith is present.

Forsythia intermedia, a hybrid between the two Chinese species, which originated in Europe some time before 1880, is superior to either of its parents. The variety *spectabilis* with rich, pure yellow flowers, each 1½ inches across, is probably the most handsome of all the Goldenbells. It is extremely floriferous and stems 6 to 8 feet long are crowded throughout the whole length with large clusters of blossoms. If only one Forsythia can be grown it should be this. Another variety of this hybrid with deep yellow flowers is *vitellina*. The variety *densiflora* has spreading and pendulous branches, much crowded, pale yellow, rather flat flowers with slightly recurved corolla lobes. The best of the pale yellow Forsythias is var. *primulina*, which originated in the Arboretum about 1910 as a chance seedling.

Forsythia europaea was discovered on the mountains of Albania by Dr. A. Baldacci in 1897, and was introduced into cultivation by means of seeds which he sent to Kew in 1899. It is of upright habit with pale gray shoots and yellow blossoms each about 1¼ inches in diameter. Of somewhat ungainly habit, growing 10 feet tall, it has proved more bud-hardy in the Arboretum than the Chinese species.

Forsythia japonica in its typical form is not represented in the Arboretum. This species is said to be abundant in the province of Bitchu in western Japan and to be related to *F. suspensa*. In central Korea grows a variety (*saxatilis*), a rather slender stemmed plant and this is now growing in the Arboretum collection.

E. H. W.

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HARVARD UNIVERSITY

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OF

POPULAR INFORMATION

SERIES 3. VOL. II

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NO. 2

Early Flowers. In front of the Administration Building *Magnolia stellata* is rapidly opening its pure white flowers and we hope that Jack Frost will this year spare the blossoms. The Red Maple (*Acer rubrum*) is still aglow, and the Katsura (*Cercidiphyllum japonicum*) is on some trees pushing forth its crimson-anthered stamens, on others its scarlet pistils. The Yellow root (*Xanthorrhiza apiifolia*) alongside the roads is opening its lurid purple, paniced flowers, which are outwardly as much unlike a Buttercup or Clematis, to which family it belongs, as those of any plant seemingly could be. The petals have fallen from David's Peach (*Prunus Davidiana*); the Leatherwood (*Dicra palustris*) and the Mezereon (*Daphne Mezereum*) are passing out of blossom but the Spicebush (*Benzoin aestivale*) is rapidly opening its yellow clustered flowers. In the Shrub Garden the first of the Honeysuckles to bloom (*Lonicera praefflorens*) has shed its pinkish flowers but the bare stems of another, the white-flowered *L. Standishii*, are studded with gaping flowers.

Rhododendron dauricum and its variety *mucronulatum* are in full blossom on Bussey Hill—the variety in a bold clump beneath the old White Pines and the species itself a little distance beyond. Each year these are the first of the Rhododendron clan to open their blossoms in the Arboretum. The typical *R. dauricum* is the more precocious of the two. Often it makes a goodly showing in late autumn and again in very early spring, but, unfortunately, its flowers are apt to be cut by frost. It is a boreal plant, widespread from the Altai Mountains in central Siberia eastward to the Japan Sea, and it is also found in Hokkaido, the northernmost island of Japan. Introduced into cultivation in England so long ago as 1780, it is a better garden plant in New England than on the other side of the Atlantic. It is a much-branched shrub, growing from 5 to 6 feet tall, with twiggy branches and more or less oval leaves, each from 1½ to 2 inches long and very fragrant when bruised. They vary greatly in degree of persistence. On some bushes the leaves change to yellow and blackish bronze and fall in late autumn; on others they persist through the winter and

remain dark green. The flowers, each developed from a separate bud, are clustered at the end of the shoot. The corolla is flattened, bright red-purple and about $1\frac{1}{2}$ inches across. There is a variety *sempervivens* with persistent, smaller leaves and smaller flowers but it has little value as an ornamental plant. The variety *mucronulatum* is a better garden plant than the type and its flowers are more pleasing in color, being a cheerful rosy purple and devoid of any suspicion of magenta. The corolla is more bell-shaped with pointed lobes and the plant is exceedingly floriferous. It is entirely deciduous, blossoming a little later than the species, and in consequence suffers less from late frosts in spring. In its typical form the variety looks quite distinct from the species but every connecting link exists. This plant is very common in Korea, where in open forests of Larch it is an erect twiggy bush often 10 feet tall. It is also found in the Chinese province of Chihli and in general may be regarded as a southeastern form of the species. It was discovered on the mountains west of Peking about 1835 by Dr. P. Y. Kirilow, but was not introduced into cultivation in this country until 1882, when Dr. E. Bretschneider sent seeds to the Arboretum. It flowered for the first time in the spring of 1888 and each season since has never failed to produce abundant blossom in the spring and a mass of pleasingly tinted foliage in the autumn. Along with it on Bussey Hill may be seen a newly recognized variety, (*ciliatum*) which, however, is indistinguishable except for the presence of a few hairs on the margins of the leaves and petioles. There is said to be a white variety (*album*), but we have not seen it in cultivation. In Europe, the British Isles in particular, a favorite and very early-flowering Rhododendron is *R. praecox*, a hybrid between *R. dauricum* and the Himalayan *R. ciliatum*. This has persistent foliage and broad, funnel-form, rose-purple to lilac-colored flowers, each about $1\frac{1}{2}$ inches in diameter. Unfortunately, in the Arboretum this plant merely exists and each year the foliage and flowers are ruined by frosts, indeed, so far as New England is concerned *R. praecox* is worthless as a hardy shrub, but those who have greenhouses will be well advised to grow this plant in tubs since it is really one of the most delightful of early-flowering Rhododendrons.

Cornus officinalis has not before blossomed so abundantly in the Arboretum. The bushes on the right of Meadow Road just beyond the Phellodendron trees are now a most pleasing sight with their clustered, star-shaped, clear yellow blossoms with prominent stamens. This is the Oriental relative of the familiar Cornelian Cherry (*Cornus mas*) and is native of central and southern Korea; also it is said to grow wild in the Chinese province of Chekiang. In Japan it has long been cultivated for its fruits, considered by the peoples of the Orient to possess valuable medicinal properties. In Korea *C. officinalis* as a wild tree grows about 35 feet tall with a trunk 4 feet in girth and an erect-spreading, rather irregular crown. The fruits are bright red, thinner and more oblong than those of the better known *Cornus mas*. In New England this Cornel ought to be generally grown. At present it is little known and quite rare in gardens, although named and figured in 1839 by Siebold and Zuccarini in their "Flora Japonica," vol.



Early-flowering Rhododendron (*dauricum* var. *mucronulatum*)

I, page 100, t. 50. The barks of trees often afford good and obvious distinguishing characters when those of flower and foliage are lacking or obscure. *C. officinalis* is a very good case in point. In flower and leaf this and the Cornelian Cherry (*C. mas*) are well-nigh indistinguishable—at any rate, they are so much alike that only a skilled observer notes the difference. The bracts enclosing the flowers are less concave and more sharply pointed, the pedicels are longer, the sepals a little larger and more acute, the petals narrower and more pointed and less recurved in *C. officinalis*; but these differences are all relative and inconstant. When grown side by side the flowers of *C. officinalis* are seen to be of a brighter yellow and the inflorescence rather more lax. The barks, however, are totally different. That of *C. mas* is close in texture, dark grey, blackish in appearance, and is firmly adherent on the branches for many years, becoming rough and flaking off in small patches and showing a grey undersurface on the trunk and old branches. In *C. officinalis* the bark is red-brown, splitting and peeling the second or third year into translucent papery shreds which cling to the branches and with the light showing through, present a pleasing appearance; on the trunk it is grey, soft and spongy in texture, and, peeling off, exposes a pale brown undersurface.

Cornus mas. Before the advent of the Oriental Witch-Hazels this was greatly appreciated in gardens as the first of spring-flowering shrubs to open its blossoms. In New England it has been very generally planted and in the early spring, when its naked twigs are starred with yellow and in the autumn, when laden with its scarlet fruits, the tree is pleasant to look upon. In southeastern Europe the inspissated juice of this fruit is made into sherbet.

The Arnold Arboretum of Harvard University is situated in Jamaica Plain, Boston, some five miles from the State House on the main parkway and near the Forest Hills terminus of the Elevated Railway. It is easily reached by automobile or by trolley car and is open from sunrise to sunset every day in the year. It was established in 1872 for the cultivation and study of all the woody plants that can withstand the climate of Massachusetts. Its present area is about 260 acres and the collections comprise some 6,500 species and varieties of tree, shrub and vine. There are nine entrance gates, of which Forest Hills Gate may be considered the principal one. The Administration Building containing offices, library and herbarium is situated just within the Jamaica Plain Gate. At this building an illustrated guide book, price 50 cents, and picture postcards, price 50 cents per set of twelve, are on sale; a sketch map of the Arboretum may be obtained free.

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NO. 3

Winter Effects. The usual practice has been to treat of this subject in the first Bulletin but the past winter has been of such a unusual character that it was thought wise to defer comments until later. The winter, so far as this part of Massachusetts is concerned, will go down in history as an extremely mild one. There has been very little zero weather, a marked absence of snow, and frost did not penetrate to any great distance into the ground. A good deal of freezing and thawing caused many small surface-rooting plants to suffer from heaving and it will be a week or two yet before the full effects of this are known. Deciduous trees, shrubs and vines in the Arboretum have passed through the winter without any noticeable damage. Conifers, Yews, Rhododendrons and other tall-growing evergreens have also wintered remarkably well. On the other hand, dwarf broad-leaf evergreens, such as are known generally as ground-covers, suffered more than for many winters past. The marked absence of snow, especially in February and March, is to blame for this. A moment's reflection will show that the more low-growing the plant the more accustomed it is to a winter blanket of snow and to the benefit of the slightest precipitation. The taller evergreens can get along without a heavy snowfall always supposing that the frost does not penetrate so deeply into the ground that their roots cannot function during late February and March.

Heather, both in exposed places and in partial shade, has suffered more in the Arboretum than for long past and we learn that similarly evil results obtain elsewhere. This damage to the Heather was accelerated by some dishonest person surreptitiously taking a lot of wood for cuttings in December. Experience has shown that any cutting of Heather late in the year is attended with disastrous results. The Spring Heath (*Erica carnea*) in the Shrub Garden has been badly damaged but the hybrid (*E. darleyensis*) has wintered well on Bussey Hill. The shrubby Candytufts (*Iberis sempervirens* and *I. Tenoreana*), the common Periwinkle (*Vinca minor*) and *Pachistima Canbyi*, all of which usually suffer no winter damage, are badly browned. The low-growing *Mahonia repens*, usually considered quite

hardy, has its foliage much scorched, whereas, side by side with it in the Shrub Garden the taller *Mahonia Aquifolium*, which normally suffers each winter, has come through unscathed. The lesson of the winter so far as evergreens are concerned would appear to be that the more dwarf the plant the more dependent its well-being is upon a covering of snow. In the absence of snow a protective covering of some sort should be laid over groundcovers during February and March.

The Oriental Witch-Hazels, Cornelian Cherry and Forsythias have never given a finer display of blossom. The Japanese Cherries are rich with promise of abundant blossom, and, so too, are the Crab-apples and Azaleas. The Lilacs made a wonderful growth last year and unless something untoward happens will produce a goodly show of blossoms, making amends for what they lack in quantity by size of flowering truss. So far as one can judge in these last days of April there is every reason to expect an unusually good season of flowers.

Autumn Transplanting. The Arboretum has always favored spring planting and transplanting but owing to the shortness of the season it is not possible to accomplish all of this work that is necessary in a garden of 260 acres. Some of the collections had become crowded and a general transplanting of relatively large shrubs and trees was urgent so the experiment of autumn transplanting was tried last fall. The weather during the season was particularly suitable for such work and the mild winter has doubtless contributed to the favorable results of the experiment. Three large Magnolias moved early in September have not suffered at all. In the same month a collection of Chinese Spruces and Silver Firs was moved to a site near the Administration Building and these too came through unscathed. Two goodly sized trees of the Japanese Spring Cherry (*Prunus subhirtella*) were moved to the Forest Hills Gate, apparently without suffering the slightest reverse. Regrouping and arranging of miscellaneous Azaleas on Bussey Hill was carried through. Among others, *Rhododendron Schlippenbachii*, always a difficult subject to move, seems to have experienced no ill effects. Indeed, a critical examination of all the plants moved last fall reveals most gratifying results. It would appear from this experiment that if the autumn be favorable and the work started early and finished by mid-November a good deal of heavy transplanting can be done without fear of loss. After good rains have fallen the latter half of August and September is an excellent time for moving Conifers and Yews, and, indeed, evergreens of all sorts; October is the month for transplanting deciduous shrubs and trees. The endeavor should be to finish the work while the ground still retains a good deal of the heat absorbed during summer.

Pieris floribunda is a good-natured, hardy, broad-leaf evergreen not so much used in gardens as its merits warrant. The first of the broad-leaf evergreen shrubs to blossom, it is at the end of April and in early May decidedly attractive. It is a native of the



A valuable broad-leaf evergreen (*Pieris floribunda*).

southern Appalachians from Virginia to Georgia, being known in cultivation since 1811 and is perfectly hardy in New England. A dense, more or less rounded, hummock-like bush, it is sometimes as much as 12 feet high and twice that in diameter. The best plant in the Arboretum is less than half these dimensions and may be seen facing the Kalmias on the right of Hemlock Hill Road. Although this plant is scarcely flowering so freely this year as it usually does another in the Shrub Garden is abundantly covered with short, erect panicles of milk-white flowers. Each flower is urn-shape, nodding and a hundred or more are collected together in each terminal cluster. The leaves are dull green, oblong to lance-shaped, each $1\frac{1}{2}$ to 2 inches long and are retained on the bush for three or four seasons. More widely known as *Andromeda floribunda*, this plant, which should be propagated by seeds, though slow-growing, is long lived. Less hardy but more beautiful is the Japanese species, *Pieris japonica*, which has longer, lustrous dark green leaves, of a ruddy hue when young, and spreading, hanging panicles of larger flowers. In the Arboretum this plant does moderately well in the shade of the Hemlock Grove but there are other gardens in the vicinity of Boston where handsome bushes may be seen. It is taller and more tree-like in habit than the American species and at its best forms a dome-shaped mass as much as 20 feet tall. It is a special feature of the relatively dry Pine woods of the southern half of Japan and nowhere are finer specimens to be seen than in the park at Nara, the old capital of Japan. Two other species, neither of them hardy in New England, are in cultivation in this country and for those who garden in the South and in California they are extremely valuable plants. The better known of the two is *P. formosa*, native of the Himalayas from Nepal eastward and also common on the mountains of western and central China. The other, *P. taiwanensis*, is indigenous on the high mountains of Formosa and was introduced into cultivation by the Arboretum in 1917. In habit these shrubs resemble the Japanese species but have even larger flowers borne in arching, sometimes erect, spreading panicles. They are good shrubs for the cool greenhouse but otherwise cannot be thought of for the gardens of New England.

Corylopsis is a genus of Oriental shrubs closely related to the Witch-Hazels but unlike the latter not very hardy in New England. All the species agree in having yellow, slightly fragrant flowers borne in short racemes on naked twigs, and, as their name suggests, in habit of growth they singularly resemble the Common Hazel. The flower buds are formed in the autumn and the flowers are among the first of spring blossoms to appear. The mild winter has been favorable to these shrubs and it is many years since the plants on Centre Street Path were so full of blossoms as they now are. The oldest species in cultivation are *C. spicata* and *C. pauciflora* from Japan, but the hardest of the group is *C. Gotoana*, seeds of which were first sent to the Arboretum by Mr. J. G. Jack in 1905 from Shinano province, central Japan.

E. H. W.

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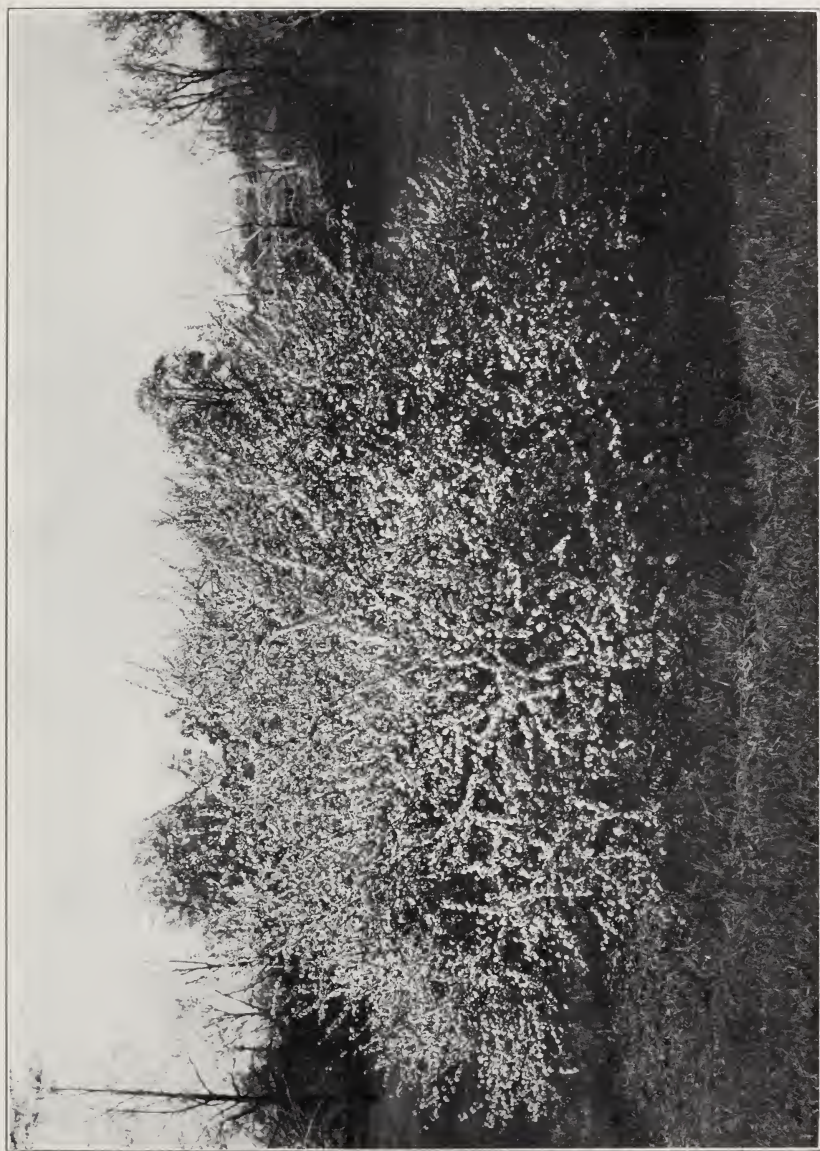
NO. 4

The Forest Hills Gate, the most popular of the entrances to the Arboretum, is just now the mecca of all interested in early flowering shrubs and trees. On the right just within the gates a collection of Japanese Cherries is in full blossom and in the distance, on the left, the Forsythias still form a cascade of rich yellow. At almost every season of the year there is something of particular interest immediately within this gate and the Japanese Cherries assembled there are a never failing feast of spring beauty. The sunny situation suits them and the well-drained sandy and gravelly loam is to their liking. Each year they make a good growth and clothe themselves with a crop of blossoms. An occasional dressing of bone-meal or cow-dung is amply repaid by the increased quantity of flowers. They are among the simplest plants to cultivate if a proper beginning is made. We have stated that their successful culture is dependent upon starting right and this means that the plants must either be of seedling origin or be grafted or budded on a congenial stock. The need of budding or grafting applies mainly to the double-flowered Cherries with which at the moment we are not concerned. The single-flowered types with a few exceptions may be raised from seeds, a fact that should delight that ever increasing class of tree-lovers who enjoy raising their own plants. These Cherries fruit more or less freely each year and if one can outwit that voracious immigrant, the European Starling, there is no difficulty in collecting a sufficient quantity. The pulp should be washed away, the seeds dried, stored in a cool place and sown in beds or boxes the following autumn and allowed to get frozen in the winter. A few, sometimes many, will germinate the following spring but the majority will lie in the ground until the second season. The seedlings grow rapidly and by transplanting several times and pruning to a single stem a supply of young trees ready to set out in permanent situations may be had in three or four years from the time of germination.

The Cherry-blossom season in Japan is, as lovers of flowers well know, the great spring festival of that land and the occasion of a national holiday decreed by the Emperor. Like all festivals, de-

pendent upon the weather, it is of a somewhat movable nature but usually it takes place early in April when thousands of Cherry-trees in Tokyo burst into bloom. At what period in the history of Japan the Cherry became established as the favorite flower is unknown, but its roots are in the dim and distant past. According to Japanese folklore the Cherry-tree itself is a lovely princess named Konohana Sakuya-Hime, reincarnate, the color of the petals being that of the blushes which suffused the cheeks of this bewitching damsel. From this pretty legend is derived the name Sakura now universally applied to the Cherry-tree in Japan. According to one Japanese authority the double-flowered varieties have been known for fully a thousand years and the single-flowered types were favorites before them. Today throughout the length and breadth of Japan Cherries are planted in temple grounds, in the parks and courtyards surrounding the old castles, in the cottager's little garden along the roadsides, and as street trees in the greater cities. That Japanese Cherries can be cultivated as successfully in this country as in Japan, is now being demonstrated. The largest collection and one that is fast becoming famous is that in Potomac Park, Washington, D. C., which owes its origin to the generosity of the city of Tokyo, which, in 1912 presented some 2,000 trees. Among them were nearly 1,000 trees of the Yoshino or Tokyo Cherry (*Prunus yedoensis*) which, planted around the tidal basin, in March and early April now draw thousands of visitors to the capital. In New York City this same Tokyo Cherry does well, flowering profusely each spring and the city fathers would be well advised to plant ten thousand of this tree in Central Park. They would probably prove short-lived on the shallow soil and under the conditions which obtain in New York City, but with a little forethought a continual supply of new trees could be maintained, for they are exceedingly rapid growing. In Boston the winters are a little too severe for the Tokyo Cherry to give of its best, and to insure a Cherry-blossom season here the Spring and Sargent Cherries have to be relied upon. In California all the Japanese Cherries can be successfully grown, including, around Pasadena and Los Angeles, the wonderful *P. campanulata* with its multitude of bell-shaped, red flowers.

Prunus subhirtella, the Spring Cherry of Japan, is one of the most beautiful of all the lesser flowering trees. It is exceedingly floriferous year after year, and its blossoms last longer than those of other single-flowered types. The first trees to blossom in western gardens are the two which now form a broad, rounded mass on the right within the Forest Hills Gate. These were sent to the Arboretum from the Botanic Garden, Tokyo, in 1894. Visitors to Tokyo, Yokohama, Kyoto and other well-known cities will not see this particular Cherry, the explanation being that it is known only from the western and more out-of-the-way parts of Japan which accounts for its late appearance in western gardens. The when or how of its origin is unknown but it is undoubtedly a dwarf form of a Cherry widely distributed throughout Japan, southern Korea and



Chinese Almond (*Prunus triloba*)

China, which is known by the name of *Prunus subhirtella ascendens*. This is a large tree, sometimes 75 feet tall with a trunk 12 feet in girth with a wide crown made up of stout branches. In some of the Tokyo parks, notable that of Ueno, groves and avenues of this Cherry-tree may be seen, but the display of blossoms is never very abundant. The Rosebud Cherry (*Prunus subhirtella pendula*) is another sport and this, on account of its pleasing habit of growth, was one of the first trees brought to this country from Japan. Another Cherry belonging to this group is *Prunus subhirtella autumnalis*, a small tree with many twiggy branches and more or less vase-shaped when young. It is a precocious plant with semi-double pink blossoms, which sometimes appear in the autumn but in other years sparsely in autumn and abundantly the next spring as is the case this year. Owing to this peculiarity, it is known when it flowers in the autumn as the Jugatsu-zakura or October-flowering Cherry and in the spring as the Yaye-higan or Double-flowered Spring Cherry. *P. subhirtella* and its varieties when raised from seeds mostly revert to the wild type (var. *ascendens*) but a certain percentage come true. The type suckers and all the varieties may be rooted from softwood cuttings taken with a heel in June but they are difficult to establish afterwards. Of this Cherry, to obtain long-lived examples they should be budded or grafted on their own seedlings. They form a little group by themselves and are apparently not happy when worked on any related stock.

Prunus incisa is absolutely hardy in the Arboretum and rivals *P. subhirtella* in abundance of blossom. This Cherry is a feature of the region in and around Mt. Fuji and is of particular interest in that it blossoms freely when quite young. As the petals fall the calyx becomes bright colored and adds fully a week to the spring beauty of this tree.

Prunus triloba. Among the spring-flowering shrubs are several different species of *Prunus* closely akin to the Cherries. Of these *P. tomentosa*, *P. japonica* and *P. glandulosa*, the two latter with double-flowered forms, are well known and highly appreciated. The most popular of this group, however, is *P. triloba*, the so-called Chinese Almond. When well grown this makes a broad bush 12 feet high and 20 feet in diameter. Its slender rigid stems are densely packed with double pink blossoms, which look like small Roses. It is a very satisfactory shrub and one that can be used in many ways in gardens. In England a favorite custom is to grow this plant against a wall espalier fashion, pruning it severely each year after flowering. Grown in this manner it is a curtain of pink in the early spring. More beautiful perhaps is the semi-double variety (*multiplex*) which was sent to the Arboretum by William Purdom in 1909. The wild type (var. *simplex*) is a charming shrub with small pure pink blossoms, yellowish red fruit the size of an ordinary Cherry, hairy but not palatable. This was first raised in this country from seeds which Dr. E. Bretschneider sent to the Arboretum in 1883. *Prunus triloba* is much cultivated in gardens of Peking, where it is known as the Elm Leaf *Prunus* (Yu-ye-mei). E. H. W.

ARNOLD ARBORETUM

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Forest Hills Gate is still the most attractive entrance to the Arboretum. The Japanese Cherries are rapidly passing out of bloom but their white-flowered European relatives, *Prunus avium* and *P. Cerasus*, of both of which there are varieties with double flowers, are just coming into blossom. A tree of *P. serrulata spontanea* is in bloom on the right and a little further down a bed of the low, twiggy *P. japonica Nakaii* from Korea. The different forms of the Chinese Almond are still in good condition. On the left a fine tree of the North China Pear (*Pyrus ussuriensis ovoidea*) is laden with a multitude of flowers and nearby other species are pushing forth their blossoms from among gray-tinted foliage. Pink *Malus micromalus*, first of the Asiatic Crabapples with colored blossoms to open, will soon be in full bloom. Across the little pond and beyond the Cherries some of the American Plums are sheeted in white. The Canadian Plum, earliest of the species to bloom, is passing but many others are at their best. On the left the Forsythias still make a goodly display of yellow and beyond, the Lilacs are showing their flower buds.

In the Shrub Garden many of the bushes are bursting into leaf. The earliest of the Spiraeas (*S. arguta*) is wreathed in white and of the Flowering Currants *Ribes aureum* is in bloom. The Asiatic Quinces are beginning to open their brilliantly colored flowers and in a week or so the whole garden will be full of leaf and blossom. In one bed a broad, round-topped bush of the Oriental *Prinsepia sinensis* is laden with rich yellow flowers nestling among the half-grown green leaves, and the air around is filled with the fragrance of almonds from the multitude of blossoms. It has been growing in the Arboretum since 1903, has never suffered winter injury and is a greater favorite with us each succeeding year. The Shrub Garden is a never failing source of interest to all visitors, filled as it is with a general miscellany of shrubs. It is not by any means an ideal situation for such a collection for it is low lying, suffers from the first frosts in the autumn and the last frosts in spring, and in zero weather the aeration is particularly bad. It is, however, the only flat piece of

land of any size that the Arboretum possesses, moreover, on account of its situation it serves a splendid purpose as a test garden. Visitors may be assured of the hardiness anywhere in New England of the plants they see growing in the Shrub Garden.

Bussey Hill is at all seasons one of the most interesting places in the Arboretum. Gathered together there are collections of the newer Chinese shrubs, Japanese Cherries, Oriental Pears, Azaleas and other ornamental plants. Some of the earlier Cherries have shed their petals but the Japanese double-flowered forms and some with single flowers are just beginning to make their display which will continue for about ten days. A few blossoms remain on *Rhododendron dauricum mucromulatum* and the buds on *R. Schlippenbachii* and *R. yedoensis poukhanense* are showing color. Soon there will be broad drifts of these plants in full bloom. From the summit of the hill looking in many directions fine views of the Arboretum can be had. Pleasing to the eye are the young unfolding leaves of the Birches, and scattered fleecy drifts of Shadblows arrest attention. In a few more days bush and tree will be clothed in spring verdure. The collection of Oriental Pears on Bussey Hill is fairly complete. The first to blossom is *Pyrus ussuriensis*, whose flowers in bud are often tinged with pink. In northeastern Asia this Pear grows to a large size and varieties of it are cultivated throughout Korea, Manchuria and North China. The wild type of the Chinese Sand Pear (*Pyrus serotina*) and the related *P. serrulata* may be seen side by side. With them are vigorous trees of *P. Calleryana*, also a Chinese species. This last-named species of Pear on account of its almost complete immunity to the dreaded fire-blight disease is likely to be of great value as an understock on which to graft varieties of the Common Pear. From an economic point of view it is possible that *P. Calleryana* may prove to be the most valuable tree the Arboretum has introduced into America. The Oriental Pear trees are rapid-growing and free-flowering, yet it is doubtful if they ever will become popular as ornamental trees, although the leaves assume rich tones of crimson and bronze in the late fall. The flowers are usually dead white and the only touch of color to be found is the anthers. The fruits are small, russet-colored and unattractive when compared with the bright hues of Crabapple fruits.

Peters Hill is noted for its collection of Hawthorns but on the top is to be found a rich and varied collection of miscellaneous trees. There on the highest land air and root drainage are both good and a greater number of trees thrive there than elsewhere in the Arboretum. For example, it is the only place where the Chinese Cedar (*Cedrela sinensis*) will live. Among the miscellaneous trees at the moment several Asiatic Cherries are in full bloom. On the broad slope the Hawthorns are rapidly pushing forth their green leaves among which nestle the flower clusters. The green leaves and fragrance of the Balsam and other Poplars by the railway are refreshing to both eye and nostril. At the foot of the hill, flanking Bussey Street, the collection of Asiatic Crabapples promises soon to be a mass of bloom,



A Valuable Introduction *Pyrus Calleryana*.

indeed, their vanguard, *Malus baccata* and its variety *mandschurica*, are in open flower. In this Crabapple the flowers are fragrant and may be either pure white or tinged with pink.

Centre Street Path, which is entered from the right of the Centre Street Gate, is bordered with a general miscellany of shrubs and trees. This section is protected somewhat from the north winds and a number of plants elsewhere tender in the Arboretum are grown here. At the moment *Corylopsis pauciflora*, *C. spicata* and *C. Gotcana* may be seen in good blossom, the original plant of *Prinsepia sinensis*, less shapely than its daughter in the Shrub Garden, is burdened with almond-scented flowers and nearby the Chinese Redbud may be seen, its naked stems studded with brightly colored flowers. The Path makes a pleasant walk now and later. It leads beneath the shade of Hickories, past the mixed border of rare shrubs to the collection of Deutzias and Spiraeas and beyond to the Conifers.

Cercis chinensis. It is to be regretted that the Chinese Redbud is not just a little more hardy. It does splendidly on Long Island and further south but in the Arboretum it only survives in a sheltered site along Centre Street Path. This tree is widely dispersed in eastern and central China, where it is often 45 feet tall with a trunk 5 feet in girth. The foliage in the autumn assumes fine tints. Such trees when laden with blossoms in the spring are conspicuous from afar. In the Arboretum, however, it is only a bush but it blooms freely and the flowers are larger and better colored than that of the native Redbud (*C. canadensis*).

Staphylea holocarpa is now for the first time blossoming freely in the Arboretum. There are two plants on Centre Street Path and the larger of the two is nicely furnished with white, hanging, clustered blossoms. Among the lesser trees of China this *Staphylea* is one of the most noteworthy. It is common on the margins of woods and thickets in central China, where it was discovered by Augustine Henry in 1888 but was not introduced until 1908 when Wilson sent seeds to the Arboretum. Usually a large bush, it sometimes forms a shapely tree from 25 to 30 feet tall with a slender trunk clothed with smooth, grayish bark. The flowers in pendulous, cymose clusters, each from 2 to 4 inches long, are borne on the naked shoots and are usually open before the 3-foliolate leaves, which subtend them, are expanded. The flowers are often suffused with pink but usually the sepals are pink and the petals white. The flowers are rich in honey and are much sought after by sunbirds, tiny brilliantly plumaged birds, which in Asia take the place of the humming birds of America. It is particularly gratifying that this ornamental tree should prove hardy in Massachusetts.

Docent Service. Commencing Sunday, May 13th, free public walks through the Arboretum under the guidance of Mr. G. M. Merrill will start from the Forest Hills Gate at 3 p. m.

E. H. W.

ARNOLD ARBORETUM

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Bussey Hill now holds the main attractions of the Arboretum. Interesting at all seasons of the year, it is particularly beautiful now with the wealth of blossoms on the Japanese Cherries, Crab-apples and Azaleas and the varied tinted young unfolding foliage. To the south and southeast the black-green of Hemlock Hill, the Cedars of Lebanon and the White Pine create a fine background. On the horizon the Blue Hills are bathed in blue or violet mists; to the west the gray and red-brown tones in flower and unfolding leaf of the Oaks, add not a little to the beauty of the scene and in a dell below, the Junipers and Arborvitae form restful groups. The charm of spring rules, birds are giving forth their music, peace and quietude reign and it is difficult to realize that this, all this, is within five miles of the State House in Boston.

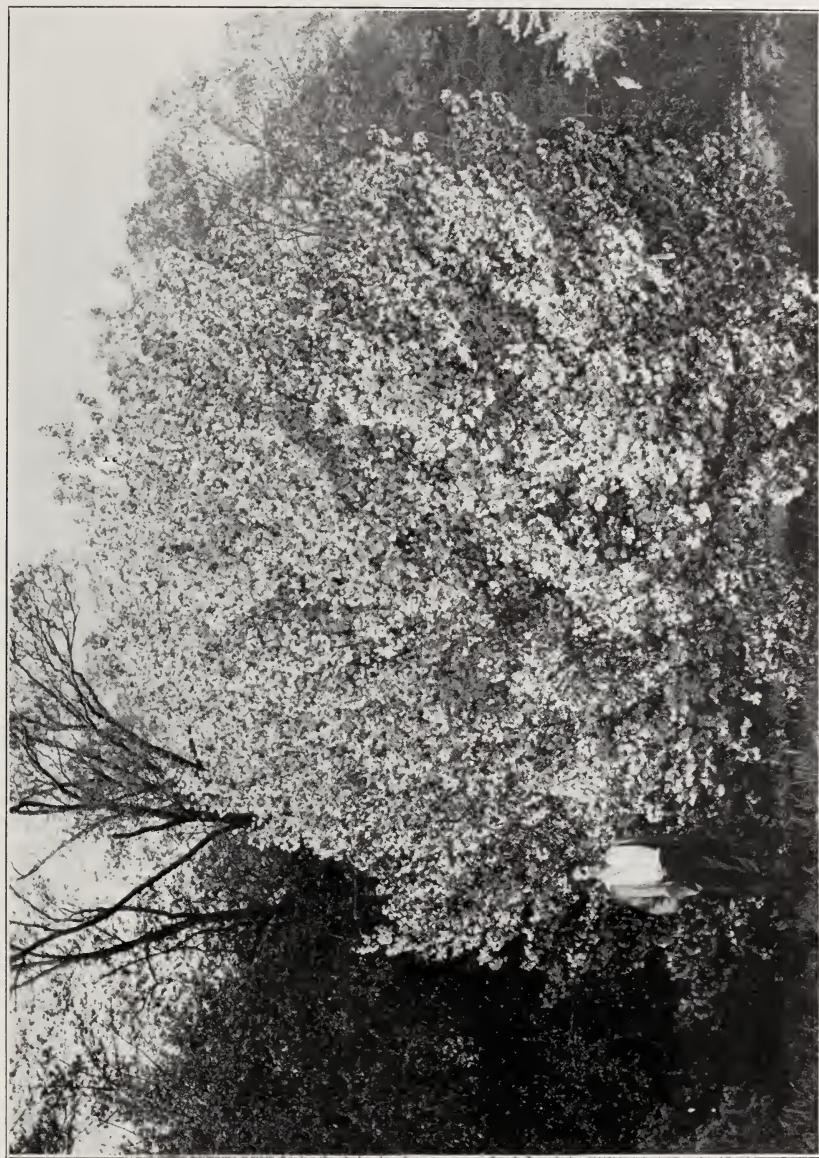
The Japanese Cherries that stud the grassy knoll of Bussey Hill are this year particularly full of blossom. Most of the single flowering varieties have shed their petals and the double-flowered forms now hold the field. The blossoms vary in color from purest white to the deepest of rose-pink, while one or two sorts are greenish yellow, a color unique among the great Cherry family. They vary a great deal in time of blossoming; some of the earliest kinds are now at their zenith, while on others the buds have scarcely begun to unfold. Six of the best are:—Horinji with pure pink blossoms. Homogena with rose-pink, Masuyama with pink, Shogetsu with almost white delicately edged with pale pink, Albo-rosea with pink passing to pure white as the flowers age and Sekiyama red in the bud and finally deep rose-pink. The two latter are the last to open their blossoms. In many of the forms the peduncle is long and the flowers hang downward; in others the peduncle is short and the flowers are densely clustered around the whole branch. The best of the pure white double-flowered sorts is Sirotae, but, unfortunately, this has very large flower-buds and frequently suffers during the winter. Among the semi-double or nearly single-flowered sorts now in blossom Kiri-gaya with pale blushing flowers, the fragrant pure white Affinis and

the extremely fragrant Gozanomanioi are particularly attractive, owing to the purity of their blossoms and the delightful fragrance which the flowers emit. Visitors are always attracted by the unusual, so Grandiflora and Gioiko with greenish yellow flowers, finer than ever before in the Arboretum, are sure of many admirers. The beauty of these Japanese Cherries is accentuated by bronze-colored young unfolding leaves which top the blossoms.

During the past ten years many references to Japanese Cherries have appeared in these Bulletins, and the Arboretum has exerted considerable effort toward putting them properly before flower lovers of this country. Unfortunately, these double and semi-double forms cannot be raised from seed, nor can they be rooted from cuttings hence recourse has to be made to budding and grafting. The process, simple enough in itself, is one in which the right kind of understock is of paramount importance if we are to have healthy, long-lived specimens in our gardens. The practice among nurserymen has been, and I regret to say still is, to graft them on understocks of the European species. For reasons which we do not understand, these understocks are unsuited to the purpose. For a year or two all appears to be well but after a short period of time the incompatibility becomes evident, the plant lingers awhile and finally dies. In this country double-flowered Japanese Cherries have been known for more than sixty years, yet today there is scarcely a good ten-year-old specimen in the country. The proper understock for Japanese Cherries in their own parent species and until these be used there will be no long-lived, healthy specimens to be found in gardens. The Arboretum has distributed great quantities of seeds of the native species for the avowed purpose of having double-flowered sorts budded or grafted thereon, but so far with little or no success. One fears that until the public arouses itself and demands that it be supplied with properly grown material, the nurserymen will continue to pursue the rough and ready methods that bring quickest returns without thought of the plants' permanence in gardens.

Rhododendron Schlippenbachii is now beautifully in blossom on Bussey Hill. Last autumn the whole collection was moved and grouped together and seems to have enjoyed the experience. This is a northern plant which starts into growth very early in the spring and, like many other such plants, is difficult to move at that season, the young growth being prone to wilt under the heat of strong sun. In early autumn, however, it can be moved as readily as any other Azalea. It is a rather slow-growing species but sturdy of habit and with its large pure pink, funnel-shaped blossoms is among the most lovely of all Azaleas. It is abundant in open woods and on exposed mountainsides in central and northern Korea; it also occurs on one or two mountains in Japan, and, though first brought into cultivation in 1893, did not reach us in quantity until 1917. It is among the hardiest of all Azaleas, should be raised from seeds and planted widely.

Rhododendron yedoense poukhanense is another Korean Azalea, being particularly abundant in the neighborhood of Seoul, the capital of



An Asiatic Crabapple, *Malus baccata*.

Korea, and southward. In open country it often forms broad carpets, but in habit of growth it varies from a dense groundcover a few inches high to a bush from 5 to 6 feet tall. It has relatively large lavender-purple flowers, a color which some people do not find attractive, but when massed and alone it is by no means displeasing. It is abundantly floriferous, the flowers very fragrant, and the habit of the plant is compact and good. Its hardiness is beyond question and, all in all, it really is a worthy member of a beautiful clan, as those who will visit the group now in full bloom on Bussey Hill must agree.

Crabapples. The Asiatic Crabapples are now at their best. A majority of the sorts are blooming with great freedom but here and there a tree which overdid itself last year is taking a holiday. Among a group so beautiful it is hard to pick out the most attractive kind. Certainly, one of the very finest is *Malus theifera*, which was pictured in this Bulletin last year. The several plants now laden with blossoms are worth coming a long way to see. The habit of the plant is very distinct and the characteristic, stiff, erect-spreading branches are clothed from base to summit with blossoms which, quite red in bud, change to rose-pink and finally to almost white. The species is native of China and is one of the few Crabapples that breeds true from seed. The best specimens are to be seen in the general Crabapple collection at the foot of Peters Hill, which is most easily reached either from the Bussey Street Gate or from the Walter Street Gate. Another specimen may be seen on the left a short distance within the Forest Hills Gate and another on Bussey Hill.

Malus spectabilis was the first of the Asiatic Crabapples introduced into western gardens, being sent from China to England before 1780. This well-known Crabapple is a tree of moderate size, sometimes 30 feet tall with a vase-shaped crown of ascending-spreading branches and arching branchlets. The flowers vary from semi-double to quite double and are of a delicate shade of pink. It has been cultivated in China from immemorial time and its wild parent is unknown. In books statements that the flowers are single or double are frequently to be found and so long ago as 1825 a single flowered form was figured in Watson's "Dendrologia," yet this form appears never to have become common in gardens nor to have been endowed with a name. In 1917 the Arboretum received from the Department of Agriculture at Washington, D. C., scions of an unknown Crabapple which were taken from a tree growing in the grounds of a temple west of Peking, China. These were grafted and one has grown into a handsome tree which is now in full blossom. It proves to be the single flowered form of *Malus spectabilis* and a plant of much garden merit. The flowers are fully an inch across, pink in color, and abundantly produced amid a wealth of bright green, young leaves.

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Cornus florida. Rarely has there been such a display of Flowering Dogwood in the Arboretum and the vicinity of Boston as at the present moment. On Long Island and southward the abundant blossoms of this tree are an annual spectacle but hereabouts it is only when favored by a mild winter that it flowers freely. Entitled to rank among the most beautiful of the lesser trees of northern forests, *Cornus florida* has an immense range of distribution, being found from eastern Massachusetts to southern Ontario and southwestern Missouri, southward to central Florida and the valley of the Brazos River in Texas, and reappearing on the mountain ranges of eastern and southern Mexico. Comparatively rare in northern Massachusetts, the Flowering Dogwood is one of the commonest and most generally distributed inhabitants of the deciduous forests of the middle and southern states, forming an under story under the shade of taller trees in rich, well drained soil from the coast well up toward the summits of the Alleghany Mountains. It is a slender tree from 15 to 40 feet tall and has a light, airy, flattened crown with the branches often in tiers. If examined in the autumn or winter the branches will be found to be dotted with gray rounded studs. As spring advances these swell and expand each into a cross, from 4 to 6 inches across at maturity, composed of four snow-white bracts which become stained with pink as they age and fall. So freely are the white crosses produced that the woodlands when viewed from vantage points are filled with seemingly floating drifts of purest white. The leaves, which develop as the showy bracts fall, are in opposite pairs and in the autumn they become brilliantly tinted, red or crimson passing to pink, with the under surface pale gray-white. The fruit is erect, scarlet and teat-like, and clustered several together add much to the beauty of the tree in the fall. The real flowers are small and inconspicuous and are crowded together in the centre of the cross. The Flowering Dogwood is at once the envy and despair of our cousins across the Atlantic. Although introduced into the British Isles so long ago as 1730 all efforts to grow it successfully

prove unavailing. Here and there a flowering specimen is known but insufficient summer heat more than the changeful spring weather is the cause of its failure under English skies.

Cornus florida rubra with rosy red bracts is a great favorite and this year its bracts seem to be more highly colored than usual. Rightly placed, say on a slope above a pond where it can be viewed across the water in which the flowers are reflected, it is particularly striking. It is often stated that all the Red Dogwood plants in cultivation originated by vegetative propagation from one individual tree discovered in the seventies of last century. As a matter of fact it is beautifully figured on plate 27 of Catesby's "Natural History of Carolina" published in 1754. There is a variety (*pendula*) with stiff pendulous branches, discovered about 1890 in the forests of Maryland, and another (*pluribracteata*) in which the number of bracts is increased to six or eight and a few small bractlets in the center replace the flowers which are nearly all aborted. This form was discovered in Orange County, North Carolina and propagated by Mr. J. D. Van Lindley, Greensboro, who in 1914 sent a plant to the Arboretum which, however, has not yet flowered. There is also a variety (*xanthocarpa*) with yellow fruits but none of these are likely to equal in popularity the type and the variety *rubra*.

Cornus kousa. The wonderful *C. Nuttallii* of western North America, the Chino-Himalayan *C. capitata*, and *C. kousa*, which is distributed from central China eastward through southern Korea into Japan, are three other tree species of Flowering Dogwood. The first two are not hardy in the Arboretum but *C. kousa* and its Chinese variety, fortunately, are. Unlike the native *C. florida*, these three species flower after the leaves expand and their buds being enfolded within the leaves enjoy a greater measure of protection. In the Arboretum the flowers of *C. kousa* and its variety *chinensis* are of greater bud hardiness than the native *C. florida*, and in consequence are even more valuable garden plants. *C. kousa* does not flower until mid-June or later, and its upstanding heads of rigid slender stalks have a foil of rich green leaves below. The floral heads, each from 5 to 6 inches across, are abundantly produced and last for fully a month finally becoming pink before they fall. The form from Japan to which the specific name belongs has been sparingly in cultivation in the Occident since about 1830. The form from China (var. *chinensis*) was introduced for the Arboretum by Wilson in 1907. The bracts are larger and broader than is usual in the Japanese type and often overlap to form a closed, flattened involucre around the button-like mass of real flowers. Some experts acclaim this the finest gift of China to western gardens; certainly it ranks high in the realm of beauty among hardy flowering trees. The fruit of *Cornus kousa* is red and strawberry-like, from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in diameter, and is very attractive in the autumn suspended amid the vari-tinted often vinous purple foliage. It is edible and the orange-colored sweetish pulp is quite palatable though in it are imbedded several large, hard, stony seeds. The native Flowering Dogwood has



Flowering Dogwood (*Cornus florida*)

been freely planted about the Arboretum but the Japanese species is confined to Centre Street Path and its Chinese variety to Bussey Hill. Not before mid-June will the Oriental Dogwoods be in blossom.

Bunchberries. It would seem a far cry from trees 30 to 80 feet tall to lowly herbs a few inches high. But a glance at the flowers shows that the relationship is very close between the Flowering Dogwoods and the Bunchberries of North America (*Cornus canadensis*) and of Europe and northern Asia (*C. suecica*). For shaded rockeries, woodlands and sheltered nooks there are no prettier little plants than these, howbeit they are rather coy unless they find soil and situation exactly to their liking.

Fothergillas. Why are the Fothergillas so little known in gardens? So long ago as 1765 one species (*F. Gardenii*) was in cultivation and in 1780 a second species, now known as *F. major*, was growing in England. These are figured in the Botanical Magazine for 1810 (tt. 1341, 1342). The genus itself commemorates an old time worthy, one Dr. John Fothergill, who in the 18th century had a garden at Stratford-le-Bow famous for its collection of American plants. Fothergillas are purely American shrubs, being native of the Alleghany Mountains and adjacent parts of the southeastern states. Three species are now recognized though the difference between two of them (*F. major* and *F. monticola*) are admittedly slight. *F. Gardenii*, the first known, is really the poor relation of the group. All three are very hardy shrubs, freely sending up erect shoots from the base which branching plentifully form dense bushes. They are relatives of the Witch-Hazels and resemble them closely in foliage. The flowers, however, are very different in appearance consisting of long, erect white stamens tipped with yellow anthers crowded together in ovoid, rounded, 2-inch high clusters at the ends of the innumerable naked branchlets. The whole inflorescence is fragrant and very conspicuous, resembling a bottle-brush and quite different from that of any other hardy northern shrub. The shrubs are very free-flowering and in the autumn the leaves assume a brilliant crimson in the case of *F. Gardenii* and red, orange and yellow in the other two species. In habit *F. major* is a sturdy compact shrub, oval in general outline and 10 feet and more tall. *F. monticola* is looser, more spreading and less tall though equally vigorous. The other species (*F. Gardenii*) is a more slender plant, seldom more than a yard high, with weak, often lolling stems, and smaller flower-clusters. In the Arboretum these Fothergillas flourish, *F. major* and *F. monticola* especially, in any soil and situation though a sandy peat soil and a cool situation best meet their needs. They fruit freely but violently eject their seeds, so careful watching is necessary if these be needed. They may also be increased by cuttings of ripened wood under glass, by layering and by suckers.

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Syringa vulgaris, the Common Lilac, is the most popular hardy flowering shrub and the plant most strongly entrenched in the affections of New England people. In all probability it was one of the first exotic plants introduced into this country but just when and where this took place is unknown. This must have been soon after the first settlers came to New England for it is a feature around old houses on Cape Cod, around Newburyport, and other long established towns and villages. Having withstood the vicissitudes of time, the Lilac is in many places the only sign that marks the sites of old homesteads. It appears to have been first cultivated in Constantinople and from there to have reached Vienna about 1563. Later its cultivation spread through western Europe. Its native habitat is the mountains of Bulgaria and other parts of the Balkan Peninsula, but this fact was not known until some three centuries after it had been brought into general cultivation. Plants of the wild type may be seen growing in the Arboretum collection. They have narrow clusters of dull purplish and by no means attractive flowers. It is evident that the Common Lilac of gardens was a form selected we know not when. Luxuriant in growth, abundant of blossom and rich in fragrance, the long cultivated form is not surpassed in these virtues by any of its numerous offspring.

Cultivation. The Common Lilac is one of the most accommodating shrubs, thrives in all sorts of queer places and often under adverse conditions. However, it appreciates proper attention to site and soil and its modern progeny demand it. A slope where the roots can enjoy good drainage and the branches be fully exposed to sun and air is the proper place to plant Lilacs. The soil should be a good strong loam and if lime be present so much the better. Indeed, if this be lacking, it must be supplied from time to time either in the form of field lime or, better still, in that of bone-meal. The Lilac is a gross feeder and to give of its best demands a liberal supply of food, farmyard manure, especially cow-dung, being the best allround fertilizer. In such soil and under such conditions the Common Lilac

and its very numerous progeny will flourish in the colder parts of this country and in lower Canada. It is essentially a plant for cold climates. In districts where the seasons are warmer than those of New England the Lilac is apt to suffer from mildew during the summer months and in the warmer states, like Florida and California, it is of little value. Its requirements are comparatively few. No pruning other than that required to keep the bushes shapely is necessary, but it should be remembered that no matter when pruning be done it means loss of flower for one season. If the bushes, through some cause or another, have become decrepit and unsightly, they may be rejuvenated by cutting down to the ground. It is surprising how good-natured Lilacs really are. They have this peculiarity, however, that they start into growth from the tops of the cut branches and the young shoots are very easily broken off by the wind. It is therefore advisable to cut them as near to the ground as is practicable. The work should be done in late March or early April in order that the plants may have the benefit of a full season in which to make new growth. When such drastic treatment is necessary the plants should be cultivated around and given a supply of fertilizer including lime or bone-meal. In June when the new growth is at its height nitrate of soda, sparingly applied to the outermost feeding roots, which are some 2 to 3 feet from the center of the plant, will be found beneficial. It is well to apply this nitrate on rainy days, about three dressings at intervals of ten days being ample. The collection of Lilacs in the Arboretum is a good illustration of the result of severe pruning followed by liberal cultivation and feeding. In the early spring of 1927 it was decided to prune the bushes severely. After this was done they were given the treatment mentioned above and during the season made new growths of from 2 to 7 feet, which this year are carrying a goodly number of extra large flower clusters. Following such pruning the weaker shoots should be removed the succeeding winter.

Propagation. Authorities agree that Lilacs should be on their own roots but the means of propagation best suited to attain this are disputed. The Common Lilac suckers very freely and on this account, except for standards, is worthless as an understock on which to graft or bud the modern sorts. By nurserymen different species of Privet are now generally used as understocks. The claim is that the Lilac is most easily propagated by this manner, that it grows rapidly and in the course of time develops its own root-system from the point where the scion is inserted. All emphasize that in time Lilacs budded or grafted on the Privet and planted deep develop their own root-system, but none say when, and in fairness to their customers they should not sell such plants until this happy state of affairs has become accomplished. That Lilacs budded or grafted low on Privet make bushy, saleable plants in one or two years, is fact, but that they make satisfactory garden plants is open to grave question. The Lilac grows faster than the Privet understock as anyone who examines a plant so grafted will see. If the thumb be taken as the size of the Lilac stem, the little finger will denote the relative thickness



A good white French Lilac, Vestale.

of the Privet understock. The root-system of the Privet understock is insufficient to supply the Lilac plant with the amount of water and food-salts necessary for its well-being and the result is, that the foliage on such grafted bushes is usually small and malformed until they develop their own root-system. From the point of view of those who want healthy plants that will grow freely from the date of planting there are only two ways of propagating Lilacs. One is by layering and the other by cuttings. Layering is a simple method of increasing not only Lilacs but nearly every other kind of shrub and small tree and a method much too infrequently practised. It consists of nothing more than notching or by other means rupturing the shoot, bending it down and covering the fracture with earth. Cuttings of moderately firm wood taken in mid-summer or soon afterwards according to locality root easily. In the Arboretum such cuttings are taken during the last days of June and the first of July. The leafy shoots are cut each from 3 to 4 inches long, with a piece of old wood, known technically as a heel, and are inserted in sand in a closed frame where they enjoy the benefit of bottom heat. Under such conditions they root in about a month. Afterwards they are moved into flats and the following spring planted out in the nursery grounds. From the start such plants are provided with their own root-system which is always sufficient to nourish the foliage and in three to four years they become nice bushy plants. Hardwood cuttings inserted in the ordinary sandpit of the propagating house in winter will root but much more slowly, often taking six months. It is admitted that Lilacs propagated from cuttings take longer to develop into saleable plants but in four or five years they overtake and soon outdistance those that have been budded or grafted on Privet.

French Lilacs, so-called because most of them have been raised in France, are the result of intercrossing and selection among the different forms of the Common Lilac. In size of inflorescence and of individual flower they far excel the parent stock but only a few retain the rich fragrance. The variety is very great and in the Arboretum collection nearly two hundred sorts may be seen. One of the most frequent inquiries is for a list of the best Lilacs. The compilation of any such list must be largely a matter of individual tastes, but the following twenty-five are entitled to high rank:

SINGLE VARIETIES: WHITE, Madame Florent Stepman, Princess Alexandria, Vestale, Mont Blanc; PALE, Lucie Baltet, Macrostachya; MEDIUM, Christophe Colomb, Madame F. Morel; DARK, Congo, Marceau, Edmond Boissier, Monge, Réaumur, Turenne.

DOUBLE VARIETIES: WHITE, Edith Cavell, Madame Casimir Périer, Princesse Clementine; PALE, Léon Gambetta; MEDIUM, Duc de Massa, Olivier de Serres, René Jarry-Desloges, Thunberg; DARK, Paul Thirion, Violetta Georges Bellair.

The Lilac collection is easily reached from Forest Hills Gate or the Centre Street Gate.

E. H. W.

ARNOLD ARBORETUM

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Conifers and Yews. In the northern parts of the world where broad-leaf evergreens are few and the trees and shrubs are bare of leaves for half the year, narrow-leaf evergreens are of special value. In such parts of America they have been favorites since gardens were first planted and they are assured of lasting popularity. In lands where broad-leaf evergreens in great variety can be grown, Conifers and Yews may be subject to the whim of fashion, but it is quite different here when the real need is for greater variety of strictly hardy sorts. Restful and beautiful at all seasons of the year, Conifers and Yews are particularly so just now when their young shoots are pushing off the winter bud-scales and unfolding a mass of light green leaves. On many the male flowers in red-purple or yellow catkins are very conspicuous and as these catkins ripen, if a branch be shaken, pollen is liberated in clouds. The Spruces and Firs push out their frond-like, young growth in advance of the upright tassels of the Pines. Earliest of all, and at the moment the most beautiful, are the Hemlocks whose young branches with their bright green leaves light up the dark mass of old foliage. As the buds expand the effect is as if the trees had been peppered with pale green; later a curtain of cheerful green is spread over the whole tree. For many years past the Carolina Hemlock (*Tsuga caroliniana*) has received favorable comment in these Bulletins. It is as hardy as the Common Hemlock and if anyone doubts its superiority in beauty they have but to visit the Pinetum and inspect the specimens growing there. Its outline is broadly pyramidal and tapering with the main branches outthrust at right angles and the branchlets drooping and clustered to form tufted masses. The whole crown is an undulating, billowy mass of dark green illuminated at this season of the year by the young growth. No tree could be more lovely than the Carolina Hemlock at the present time.

We are apt to think of Conifers in the autumn and winter seasons only but their beauty at this moment is greater than at any other time of the year. Conifers strongly object to smoke and deleterious gases and for this reason are unsuited for planting in cities or in the

vicinity of factories. The majority are mountain plants and as such demand pure air. A number of species of Pine grow in the poorest of sandy soils and they, together with certain Junipers, withstand a certain amount of drought, but, on the whole, Conifers demand a constant supply of moisture at the roots. A good loam overlying clay and a sloping hillside is the ideal place for them. What has been written applies equally to the Yews, of which the Japanese species (*Taxus cuspidata*) and its varieties are among the most valuable plants northern gardens possess. The Yews are more tolerant of city conditions than are Conifers, so, if evergreens are needed in cities, Yews only are worth planting.

Pseudolarix amabilis. Attention is called to the group of this Conifer, the Chinese Golden Larch, immediately on the left entering from the Walter Street Gate. Like the Larch it is deciduous in character, its leaves changing to a rich golden yellow in the late autumn. The branches are wide-spreading, somewhat ascending and richly clothed in summer with emerald green leaves which are borne in whorls, each terminating a short, spur-like shoot. At the moment many spur-like shoots are crowned with lax clusters of male flowers arranged in erect catkins. Several of the lower branches are weighted down with these curious flowers which emit clouds of yellow pollen and are well-worth the inspection of students interested in botany.

On Bussey Hill, Albo-rosea with white flushed pink and Sekiyama with rose-pink blossoms, latest of the Japanese Cherries to flower, still make a brave display, their branches being thickly hung with rose-like blooms. The Dogwood remains in blossom, the earliest of the Brooms are pushing forth their gay-colored flowers, but the Torch Azalea (*Rhododendron obtusum Kaempferi*) now dominates the scene. This floriferous shrubs with its dazzling blossoms is at the height of its glory. It is perhaps the most spectacular of the whole race of Azaleas and the marvel is that a plant of such exotic appearance should be able to withstand the winters of Massachusetts. It prefers high land or at least a sloping bank and its flowers are seen to best advantage against a dark background of Hemlocks or other Conifers or under the shade of trees. It is a twiggy shrub, growing from 5 to 8 feet tall and as much in diameter, with the familiar characteristics of the so-called Indian Azalea. It does best when grouped thickly so that its branches shade the roots. On account of its color, which varies from salmon and crushed strawberry to flaming red, it needs careful placing for its full effect to be enjoyed. Although known in books since 1712 and a common plant on mountains from the extreme south to the northernmost island of Japan, it was utterly neglected by the early plant explorers in that land. Not until 1892, when the late Professor Sargent sent seeds to the Arboretum, was this Azalea introduced into cultivation. Had he done naught else but introduce this plant garden lovers would have just cause to bless his name. Of all the shrubs that Japan has contributed to the gardens of North America none is more strikingly handsome than this flaming Torch Azalea.



Winsome *Azalea Vaseyi*.

Azalea Vaseyi is a winsome plant and among the whole *Azalea* tribe there is no purer or more pleasing bit of pink than the gaping blossoms of this delightful shrub. The branches are slender and upright and there is an airiness and grace about the plant not common among the *Azaleas*. It is of easy culture but prefers a moist situation and if planted where its blossoms can be reflected in water its beauty is seen to two-fold advantage. Native of the higher mountains of western North Carolina, this *Azalea* was discovered in 1878 by George Vasey. It was introduced in 1880 into the Arboretum, where it has never known winter injury, and each year, toward the close of May, the groups of plants on the right and left of the Meadow Road are aglow with pink blossoms.

Diervilla Maximowiczii is now flowering freely on Centre Street Path and is very distinct from other species of *Diervilla*. A shrub some 3 to 5 feet tall, it has slender, arching branches and thin, bright green leaves. In color the flower is greenish yellow with a prominent orange-brown stripe on the lower corolla-lobe and throat. In other *Diervillas* the stamens are alternate with the corolla-lobes, but in this species they are collected under the upper part of the corolla and the anthers are united laterally. The flower is in appearance very much like that of a *Pentstemon*. Native of the margins of woodland and thickets from central Japan northward, *D. Maximowiczii* was introduced into cultivation by the Arboretum through seeds sent in 1914 from the Nikko region by Wilson. It is a very distinct and pleasing shrub and has proved quite hardy.

Kerria japonica and its double-flowered form *pleniflora* are old-fashioned plants which well deserve a place in gardens. They are twiggy shrubs sending up each year from the base a mass of shoots which remain bright green throughout the year. No other shrub, not even the green-stemmed Dogwood, has such cheerful shoots in the winter time. The flowers, borne along the whole length of the smooth, slender, arching stems, are a deep buttercup yellow and the double-flowered form strongly suggests a Rambler Rose. This plant does well against walls, on banks or high land, where it can enjoy good air and root drainage. Both forms are easily propagated from suckers and suffer from no disease or pest. After flowering the older canes should be cut clean away; no other pruning is necessary. *Kerria* is native of China and southern Japan, where it is also a favorite garden plant. The double-flowered form was introduced into cultivation from Canton so long ago as 1805. Our grandparents knew and appreciated it well and while it has been somewhat crowded out in later times *Kerria* is still one of the most beautiful of late spring-flowering shrubs. Visitors to rural parts of England may see the double-flowered form frequently trained as a curtain against the stone walls of thatched cottages.

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Early June is a season of plenteous blossom in the Arboretum. The numerous forms of the Common Lilac are passing out of flower but the Persian and Rouen Lilacs and a number of the species are in full bloom. Early-flowering Roses in white, yellow and pink, together with Honeysuckles, Diervillas, Wistarias, Azaleas and the early Rhododendrons, are in blossom. All the leaves are not yet fully unfolded on tree and bush and there is still a rich range of color in the young foliage. In any and every part of the Arboretum beauty may be seen.

Enkianthus is an Oriental genus of shrubs belonging to the Rhododendron family which is distributed from the eastern Himalayas through the mountains of China to Japan but is not found in Korea. The Himalayan and Chinese species have not proved hardy in the Arboretum but the several species from Japan thrive on a windswept slope beneath the group of old White Pines on Bussey Hill. The first species to open its blossoms is *E. perulatus*, better known under the name of *E. japonicus*, a dense, rounded bush of perfect habit which is grown in every Japanese garden. Its native home, the mountains of the island of Shikoku, has only recently become known. It has small clusters of pure white, urn-shaped flowers which push out with or before the young foliage and are now past. The most vigorous, floriferous and all-round valuable species of the genus is *E. campanulatus*. This is a large shrub or bushy tree, sometimes 25 feet tall, irregular in outline with cymose clusters of suspended bell-shaped flowers thrust from the tip of every branch. The corolla varies in color from shades of salmon-pink to reddish crimson and is often beautifully pencilled with lighter and deeper tones. It also varies a good deal in size and somewhat in shape and this together with the variation in color has caused some botanists to recognize a number of different species. However, where a large group is cultivated it is obvious that they merge one into the other. One variety (*albiflorus*) has handsome greenish white and another (*Palibinii*) dark red flowers, but shades of salmon-color prevail and all are

equally lovely. Another species, *E. subsessilis*, is of dense, twiggy habit, forming a neat compact bush up to 10 feet tall, bearing in quantity creamy white flowers in pendent racemes. A rare plant is *E. cernuus* which has cream-colored flowers and is not growing in the Arboretum, where the more common variety (*rubens*) distinguished by the dark red color of its flowers, represents the species. In this *Enkianthus* the corolla lobes are notched and in consequence the flowers are different in appearance from those of other members of the group. These Japanese species of *Enkianthus* are perfectly hardy in Massachusetts and well worth a place in gardens. Where lime is absent from the soil their cultivation is as simple as that of Azaleas. They demand, however, good air and root drainage. The foliage of no other shrub assumes more brilliant autumn tints, the colors ranging from yellow and orange to the deepest tones of crimson. They are not subject to any disease or pest and rank among the most satisfactory and beautiful members of the large *Erica* family to which they belong.

Rhododendron japonicum. On Bussey Hill this handsome Azalea is now at the height of its beauty. The large, funnel-form flowers are borne in clusters at the end of every shoot and vary in color from orange to salmon-red and flame color. It is a shrub, seldom exceeding 6 feet in height, with stiff, erect branches and is especially well-adapted for massing. It is widely distributed on the mountains of Japan and has been in cultivation since 1861. Crossed with its Chinese relative, *R. molle*, it has given rise to the so-called Mollis Azaleas, but, unfortunately, the Chinese species is tender and this weakness is evident in many of the hybrid race. Where the blood of the Japanese species is predominant the plants are quite hardy; contrariwise, where that of the Chinese plant is in the ascendancy the plants are unsatisfactory, dying in part or wholly during severe winters. Louisa Hunnewell, one form of these Hybrid Azaleas, which was raised by T. H. Hatfield, Superintendent of the Hunnewell Estate at Wellesley, Massachusetts, who hybridized plants raised from seed collected in one case in Central China and in the other in the Nikko region of Japan, has proved perfectly bud-hardy in the Arboretum. This is a lovely plant with flaming orange-yellow flowers borne in large clusters and, like those of its parents, sweetly fragrant. This type of Azalea requires full exposure to the sun and flourishes best where good root drainage is assured but it appreciates protection from strong winds.

Viburnum tomentosum is one of the most handsome of all the Oriental Viburnums, although less well-known in gardens than its snowball form (*sterile*) to which the name *V. plicatum* is generally applied. The type is a large shrub, sometimes 15 feet tall, with stiff, wide-spreading branches arranged more or less in tiers. The flat, flower-clusters, each from 3 to 5 inches across, terminate short lateral branchlets and are produced along the entire length of the shoots. They are borne erect on stout peduncles and each has a conspicuous outer whorl of large, white, neuter flowers. It is to the



Bechtel's Crab, *Malus ioensis plena*.

abundance of these neuter flowers that the shrub owes its ornamental character, for its autumn tints are poor and its fruit black and unattractive. Strictly speaking it is a woodland plant and thrives best in a cool, partially shaded position. Under full exposure to the sun large branches are apt to die from no apparent reason. In the familiar snowball form the central mass of small, fertile flowers is changed into a globose group of showy neuter blossoms. Native of the Far East, this *Viburnum* is a particular feature of the woodlands and thickets of Japan whence it was introduced so long ago as 1865.

Malus ioensis plena, Bechtel's Crab. Of all the Crabapples this seems to hold first place in public affection and with its profusion of large, pale pink, rose-like, semi-double flowers and its delightful odor of violets, it is a singularly handsome and attractive tree. Unfortunately, the practice is to graft it on understocks of the Common Apple, a stock quite unsuited to its needs. This results in short-lived trees, a disappointment only too well known to lovers of this fragrant Crabapple. It should be grafted or budded on its wild parent (*M. ioensis*) or on the related *M. coronaria*, under which conditions it is healthy, long-lived and free-growing. On the left, opposite the junction of the Forest Hills and Meadow roads may be seen a Bechtel's Crab on the Common Apple understock—a sparsely branched, unhealthy looking tree. In the Crabapple collection at the foot of Peters Hill on the right entering from Bussey Street Gate grow two specimens grafted on the wild parent and the contrast sufficiently tells the story. The way to check the malpractice of grafting this Crabapple on the wrong understock is to refuse to buy plants unless guaranteed to be on understocks of an American species. It is only by the amateur taking decisive steps that the necessary change can be brought about.

Wistaria floribunda rosea. There are many so-called pink forms of the Japanese Wistaria but the one strictly entitled to the name may be seen blossoming at the end of the trellis bordering the Shrub Garden. The parent of this particular plant was found many years ago growing in a garden owned by a Japanese in California. It came to the attention of the late Mr. Henry S. Huntington, San Marino Ranch, San Gabriel, California, who purchased the whole place for the purpose of acquiring this handsome vine. The Arboretum obtained scions from Mr. Huntington in 1917 and a resultant plant is now flowering for the first time. The racemes are about a foot long, the standard and wings of the corolla are flushed with pink and the keel is pure pink. It is just as hardy as the ordinary lavender and white forms of the Japanese Wistaria. E. H. W.

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Hybrid Rhododendrons are by common consent among the noblest broad-leaf evergreens that can be grown in northern gardens. They are largely the product of crossing and intercrossing the two American species, *R. catawbiense* and *R. maximum*, with the Himalayan *R. arboreum*, and the Eurasian *R. ponticum*, and *R. caucasicum* from the Caucasus. They owe their red and crimson colors chiefly to the Himalayan and their hardiness to the blood of the American and Caucasian species. Most of the standard hardy sorts growing in the Arboretum were raised in England, mainly by the firm of Anthony Waterer & Sons, more than three-quarters of a century ago. Mr. E. S. Rand, Jr., wrote his book on Rhododendrons in 1871 and those who turn to its pages will note that with few exceptions the hardy and reliable varieties we know today are mentioned there.

Since the Bulletins were first issued reference has been made each year to these Rhododendrons. Their behavior in the Arboretum has been set down together with the experiences of half a century in cultivating these plants. It cannot be said that success has crowned the persistent efforts of the Arboretum. Indeed, fewer varieties are growing there today than a quarter of a century ago. The site, under the lee of Hemlock Hill, facing more or less north and to some extent protected from the sun in March, would appear to be perfect but the Rhododendrons do not flourish as they should. The toughest and hardiest varieties make a good showing each succeeding year but dead branches and brown leaves are too much in evidence on many of them every spring. In England, where Rhododendrons are special favorites, great progress in their culture has been made during the past twenty-five years. It has been found that wind is the curse of these plants and that greater success is attained when they are planted through thin woods, especially Oak woods, where the ground is moist and cool throughout the year and where the branches of the trees break the direct rays of the sun. Too much shade is detrimental to the setting of a crop of flower-buds but not enough induces browning of the foliage. Also, it has been found that the best way of mulching Rhododendrons is by laying rather stout branches about the roots and sprinkling over them a

modicum of oak leaves. Under this treatment the known hardy hybrids give better results; many formerly thought to be tender prove quite hardy and hundreds of new species recently discovered and introduced from western China grow happily. It is evident that we have something to learn from the recent successes of Rhododendron enthusiasts in the British Isles. In fact we might try their experiments with every probability of success greater than we now enjoy with these favored plants. Rand in his book enumerates, with the exception of Mrs. Charles Sargent, Henrietta Sargent, Mrs. Harry Ingersoll, Catawbiense album and Boule de Neige, all the really hardy sorts of first-class quality grown in the Arboretum. All of these are of foreign origin, indeed, so far as the Arboretum is aware, no first-class variety of perfect hardiness in Massachusetts has been raised in this country. This is little to the credit of our nurserymen. Prior to quarantine No. 37 going into effect the supply of Rhododendrons for this country was annually imported from Europe. When importation ceased stocks were speedily sold out. Today it is exceedingly difficult to buy sizeable hybrid Rhododendrons of any sort in America.

Anthony Waterer used to propagate his plants mainly by layering, but nowadays *R. ponticum*, unfortunately tender in New England, is largely used as an understock. No other understock has yet been found equal to this Eurasian species, yet for us its use is unwise, and, if none other is available, layering should be resorted to. With the exception of a collection of indifferent quality which came from Germany in 1908, the Arboretum has received no really hardy sorts that have originated later than 1885. No one will assume that the possibilities of raising new and worthwhile varieties have been exhausted. It is simply that the subject has been neglected and it is high time that it was taken up seriously in this country. Indeed, if New England is ever to enjoy really hardy hybrid Rhododendrons in variety they will have to be raised there. A splendid field for the hybridist and for the younger generation of nurserymen is open. By crossing and intercrossing the hardiest and toughest of the hybrids we now enjoy with some of the known hardy species like *R. Smirnowii*, *R. Metternichii*, *R. brachycarpum* and *R. carolinianum*, there is every probability of largely increasing the list of hardy hybrid Rhododendrons well-suited to the climate of Massachusetts and southward. Until some enterprise is shown in this direction Rhododendron lovers will be left to deplore the paucity of good sorts available for their gardens. Today, so far as the Arboretum's experiences go, the following rank among the best of the hybrid Rhododendrons: with red flowers—Atrosanguineum, Charles Dickens, H. W. Sargent; with reddish flowers—Caractacus; with rose-colored flowers—Roseum elegans, Lady Armstrong; with pink flowers—Mrs. Charles Sargent, Henrietta Sargent; with dark purple flowers—Purpureum grandiflorum, Purpureum Elegans; with light purple flowers—Everestianum; with white or nearly white flowers—Album Elegans, Album Grandiflorum, Catawbiense Album. Earlier than these to blossom are the so-called Caucasian Hybrids of which Mont Blanc, Boule de Neige, Coriaceum, Glennyanum and Cassiope, all with white or



Hybrid Caucasian Rhododendron, Glennyanum

nearly white flowers. These and other varieties of less value are now in blossom in the collection at the foot of Hemlock Hill, which is easily reached from South Street Gate.

Styrax obassia. A shapely specimen some 18 feet tall of this Japanese tree is now in bloom on Bussey Hill. It has shortly stalked, broadly ovate leaves, each 4 to 7 inches long and as many broad, dark green above and silvery gray below. The flowers are bell-shaped, arranged in erect or sub-erect racemes 4 to 6 inches long. The corolla is of the purest white, so too, are the filaments, but the anthers are clear yellow. The flower racemes, although produced in great quantity are somewhat hidden by the bold foliage.

Styrax japonica is a bushy tree of moderate size, seldom exceeding 30 feet in height and as much in diameter, which is common on the mountains of Japan. It is also found in southern Korea and in central China. It has leaves light green on both surfaces, more or less ovate, lance-shaped and each from 2 to 3 inches in length. The bell-shaped flowers are borne in cymose clusters at the ends of every branchlet and the corolla is of pure, waxy white. No other tree is more abundant of blossoms and viewed from below when in full flower its myriads of pure white bells present a charming picture as anyone who examines the large specimen on Centre Street Path will agree. The tree fruits freely each autumn and thousands of seedlings spring up spontaneously beneath its shade. It has been growing in the Arboretum since 1892 and except in early youth has not suffered winter injury. Like many other plants these *Styrax* are apt to winterkill when young. Moreover, they do not transplant readily from open ground, so it is best to grow them along in pots. These two species of *Styrax* are among the most lovely of the lesser trees that can be grown in the climate of Massachusetts and are well worth a little extra trouble to establish. The genus is widely distributed, several species being native of eastern North America and many in central and western China but the above only are properly hardy in the Arboretum.

Syringa Wolfii. This handsome species, native of the woodlands of central and northern Korea and adjacent Manchuria, is now in flower above the Forsythia group. It has large oblong to ovate-lance-shaped leaves, dark green above and pale on the underside, and much branched panicles of dark lilac-purple flowers. The lateral branches of the panicles droop somewhat and the individual flower is tubular, dilated at the mouth with incurved, somewhat hooked, corolla lobes. This plant was discovered by V. L. Komarov and by him introduced into the Botanic Garden at St. Petersburg sometime before 1910. A plant was sent to the Arboretum but whether it was the true species or not is uncertain for the plant has been lost. That now in flower was raised from seeds collected in Korea by Wilson in 1917. Besides the type there is a form distinguished by the presence of a few hairs along the mid-rib on the underside of the leaf. *S. Wolfii* is a handsome and very hardy shrub but is only one of numerous species of Lilac that are wellworth a place in gardens. E. H. W.

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The Shrub Garden, which occupies about three acres of land immediately on the right, entering from Forest Hills Gate, is now full of interest. Here may be seen a varied collection of shrubs arranged in parallel beds, separated by grass paths, so that the individual plants can be easily examined. Spring-flowering shrubs, many Barberries and the earliest of the Spiraeas are past flowering, but *Spiraea Henryi*, a dome-shaped bush more than 6 feet tall with arching branches laden with Hawthorn-scented flowers, is at the height of its beauty. This native of central China is one of the best of its clan. The Korean *S. trichocarpa* of perfect hardiness and graceful habit has been very full of blossom but is now past its best. Closely related to the Spiraeas is *Physocarpus*, of which several species are now in bloom. These shrubs, which are commonly called Ninebarks, are vigorous plants needing plenty of space to be seen to advantage. One of the handsomest is *P. bracteatus*, native of Colorado, a rounded bush 6 feet and more tall and broader than high, which produces in great abundance dome-shaped clusters of Hawthorn-like blossoms in which pink-anthered stamens are prominent. With the exception of *P. amurensis*, which hails from northeastern Asia, the genus is entirely North American. The shrubby, yellow Cinquefoil (*Potentilla fruticosa*) is covered with pleasing blossoms and, so too, are its white-flowered varieties, *Veitchii* and *dahurica*. All are very hardy plants not particular as to soil and thrive in stony ground.

Among that useful group, the Bush Honeysuckles, several late-flowering species such as graceful, gray-leaved, pink-blossomed *Lonicera Korolkowii*, white-flowered *L. Maackii podocarpa*, pale yellow *L. deflexicalyx* and lilac-colored *L. thibetica* are in blossom, while the early-flowering *L. Altmannii* and *L. fragrantissima* are laden with ripe, bright red fruits and *L. coerulea* and its varieties with dark blue fruits. The Diervillas are shedding their blossoms but many of the Philadelphus are opening their flowers as are different species of Hydrangea. The mild winter was favorable to the Diervillas, which this year have been marked by less dead wood and more blossoms than usual. This group of shrubs like the Deutzias just miss being

properly hardy in the Arboretum. Summer-blooming shrubs, such as the pink *Indigofera Kirilowii* and the yellow *Colutea arborescens* are opening their blossoms and soon will be followed by those of a variety of kindred shrubs. The feature of the Shrub Garden just now, however, is the different Wild Roses decked in white, pink, red and yellow. Those interested in Rose species may spend a profitable time in inspecting this collection and also the named varieties of Rugosa Hybrids of recent origin and great value in northern gardens. Of these Rugosa Hybrids the fragrant, dark red Roserie de L'Hay, rose-pink Belle Poitevine, snow white Blanche Double de Coubert, white Sir Thomas Lipton, bright red, fringed-petaled F. J. Grootendorst, and Max Graf with pink flowers and lustrous foliage, are most worthy. Among the species are *R. Serafinii* with gray leaves and dainty white flowers, *R. rubrifolia* with rose-colored blossoms, rose-red *R. bella*, white-blossomed *R. Fedtschenkoana*, fragrant Sweetbriar (*R. eglanteria*), *R. rugosa rosea* with pink and variety *alba* with white flowers; such old-fashioned Roses as *R. damascena*, *R. centifolia*, *R. alba*, the Apple Rose (*R. villosa duplex*), the Boursault Rose (*R. Lheritierana*), many forms of the Scotch Roses and that most satisfactory hardy yellow Rose, *R. Harisonii*, are in full blossom. Such early species as *R. Ecae*, *R. Hugonis* and *R. omeiensis* are past but *R. multiflora* and its pink-flowered variety, *cathayensis*, the Seashore Rose of New England (*R. virginiana*) and other species will open their flowers in a few days and for two or three weeks will continue the Wild Rose season.

Centre Street Path, which is entered through the Hickory group immediately on the right of Centre Street Gate, makes a pleasant walk at any season. The situation is more sheltered than other parts of the Arboretum and in the borders flanking this path a number of rare shrubs and trees of doubtful hardiness may be seen. Among others the rare *Pterostyrax hispida*, a tree of moderate size, native of the Orient and closely related to *Halesia*, or Silverbell tree, is opening its blossoms. The flowers are produced in loose, hanging clusters terminating lateral branchlets on the previous season's growth. The corolla and the filaments are pure white and the anthers are of the palest cream-color. It is an interesting tree which one wishes had a more vigorous constitution. The Japanese *Styrax japonica* is still in blossom, so too, is the rare *Viburnum bracteatum*, native of Georgia and Alabama, the Japanese *Magnolia Watsonii* with cup-shaped flowers emitting a heavy odor of spices, and the Dogwood (*Cornus kousa*) of the same land is wreathed in white. But the greatest display of blossoms along Centre Street Path is that of the supplementary collection of Spiraeas and of the group of Deutzias. A protected spot and cool soil suit the latter better than any other place in the Arboretum and there may be seen many of the finest hybrids of Lemoine and such handsome species as *D. Vilmorinae* and *D. Wilsonii*, comparatively recent acquisitions from western China. Among the Spiraeas, large specimens of *S. trichocarpa*, *S. Henryi* and the small-leaved, twiggy *S. gemmata* are particularly noteworthy.



A Handsome Native Shrub, *Viburnum cassinoides*.

Bussey Hill with its rare shrubs and lesser trees from the Orient and elsewhere is a place to visit at all seasons of the year and, at the moment, its western slopes are ablaze with brilliant blossoms of the Flame Azalea (*Rhododendron calendulaceum*). Several species of *Cytisus*, a number of new and rare *Deutzias* and *Spiraeas* are in full blossom in the borders and, so too, is *Rosa Moyesii* from western China. The wet and cloudy season has suited this Rose and its flowers are of a better color than is usual. No Rose has been more written about than this species and its rich, dark velvety blossoms are among the most exquisitely colored of all Roses. The original plant of the Beautybush (*Kolkwitzia amabilis*), which has been growing on Bussey Hill for nearly twenty years, is again laden with its pleasing pink *Diervilla*-like blossoms. This lovely shrub is absolutely hardy and should be widely grown in the colder parts of this country. The spiny *Sophora viciifolia* has racemose, pea-like blossoms with a white corolla and a slaty blue calyx which make a pleasing combination. Close by this shrub on Bussey Hill are two forms of *Indigofera amblyantha* whose branches are densely crowded with erect, spike-like racemes of rose-colored blossoms.

Not before has the Chinese Dogwood (*Cornus kousa chinensis*) borne blossoms so abundantly as this year. At this time it is easily the most conspicuous plant in the Arboretum and worth a long journey to see. The tree on Bussey Hill is vase-shaped, bushy and about 18 feet tall and every branch and branchlet is crowded with flowers. At the moment the bracts are cream-colored but later they will become pure white and finally pinkish. The four bracts which subtend the button-like cluster of the flowers proper are arranged in the form of a cross and overlap at the base. They are ovate, sharp-pointed and larger than those of the American *C. florida*. The Chinese Dogwood was raised from seeds sent to the Arboretum by Wilson in 1907 and has been acclaimed by experts as the most valuable of the lesser trees China has contributed to the gardens of the Occident.

Viburnum cassinoides is one of the most common shrubs of New England and a worthy member of a very ornamental tribe. Under cultivation it grows from 6 to 10 feet tall, has erect, spreading stems and forms a compact bush. Its short-petioled leaves are dark green, somewhat leathery in texture, more or less oblong-lance-shaped and each from 2 to 3 inches in length. The flowers, white with conspicuous, much protruded yellow-anthered stamens, are borne in flattened, rounded clusters, each from 3 to 5 inches in diameter. These are followed by fruit which, varying in color as it ripens from white through pink to deep blue, is the crowning glory of this handsome native shrub.

E. H. W.

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Silver Firs as ornamental trees rank among the handsomest of all Conifers. Their lofty stature, symmetry of growth, density of branches and abundance of foliage are arresting features. They are essentially mountain trees which demand pure atmosphere and are therefore quite unsuited for city conditions. A good loamy soil and a sloping situation, where the drainage is good and yet where they never suffer from drought, are the ideal conditions for growing these trees. They are widespread on the mountains of the temperate regions of the northern hemisphere, where they often form pure forests. In North America they are found as far south as the mountains of Guatemala, and in the Old World they reach northern Africa, the Himalayas and the mountains of Formosa. Of the thirty-five species recognized, twenty-three are growing in the Arboretum, but only a few of them really thrive. It is much to be regretted that the climate of north-eastern America is such that the magnificent species clothing the mountains of the Pacific Slope cannot flourish.

Of the eleven species native of North America only the Colorado White Fir (*Abies concolor*) is really satisfactory in the Arboretum. Fortunately, this handsome species ranks as one of the finest of the family and if one Silver Fir only can be grown it should be this. Its foliage is soft to the touch and varies from gray-green to glaucous blue in color and is singularly handsome. The tree is very symmetrical in outline, forming an even, pyramidal mass, and the very numerous branches overlap one another in a manner neat and pleasing. The trees in the Arboretum, planted in 1874, are now 60 feet tall and among the most beautiful specimens in the pinetum. The variety, *Lowiana*, distinguished by its much longer leaves, is, unfortunately, not a satisfactory tree in the Arboretum. It is native of the Pacific coast from Oregon to California, where it is often 250 feet tall. *Abies homolepis*, more generally known as *A. brachyphylla*, the Nikko Fir, is a tree sometimes 120 feet tall with wide-spreading branches, dark green leaves, silvery on the underside, and one of the handsomest of all Silver Firs. Its branches are long and sweep the ground, and the tree is broader in outline than most Silver Firs. The leaves spread

outward and upward and are unequal in length and soft to the touch. The grooved shoot is a ready means of distinguishing the species. There is a variety *umbellata* with green cones, many specimens of which are growing in the Arboretum, all of them less compact in habit than the type. The Greek Fir (*Abies cephalonica*) has dark green, ascending and spreading leaves harsh to the touch. As a wild tree it grows 100 feet tall and is somewhat variable in appearance. The branches are smooth, shining red-brown, and its pungent leaves are spread radially and slightly directed forward. The Cilician Fir (*Abies cilicica*) with soft, dark green foliage is looser in habit than its relative, the Nordmann Fir, and its foliage is duller in appearance. The branchlets are gray and covered with hairs and the leaves spread upwards and forward except on the weak shoots, where they are radially arranged. On the mountains of Syria and Asia Minor it is a tree 100 feet tall with smooth, ashy gray bark, which becomes scaly on old trees. The Nordmann or Caucasian Fir (*Abies Nordmanniana*) with lustrous, dark green foliage, silvery on the under side, is one of the most beautiful of all Silver Firs. Fortunately, it does well in Massachusetts and is hardy as far north as southern Ontario. In cultivation it is dense in habit, its branches are not wide-spreading and it forms a narrow, pyramidal tree easily recognized by its shining foliage. This Silver Fir is found on the Caucasus, on the mountains of Asia Minor and also in Greece. *Abies Fargesii* is one of the new species from western China and bids fair to rank among the most useful of the Silver Firs. It is easily recognized by its remarkable, shining, brown-purple shoots, its dark green leaves, spreading and of unequal length, and white on the underside. In China it is a tree 100 feet tall with massive, tabuliform branches. Introduced by the Arboretum in 1910, it has grown slowly but has not suffered winter injury. The rate of growth is now more rapid and promises to equal that of other species. Two other Chinese Silver Firs (*A. recurvata* and *A. chinensis*) have also proved hardy and are growing well.

Hybrid Philadelphus Lemoinei and its various forms are now in full blossom in the group facing the Lilac collection. While the varieties differ in the size, shape and character of the flower, they agree generally in being twiggy shrubs of compact, rounded habit and remarkably floriferous, and the fragrance of their single or semi-double blossoms is delightful. Among the best of this particular group may be mentioned Mont Blanc, Candelabre, Monteau d'hermine, Erectus, Boule d'argent and Avalanche. This most pleasing group of *Philadelphus* resulted from crossing *P. microphyllus*, which is native of Colorado, New Mexico and Arizona, with the Eurasian *P. coronarius* and worthily commemorates the hybridist to whom gardens owe so many beautiful shrubs. *P. Lemoinei* has been crossed with other species and one result of this is the handsome Albrâtre with double flowers.

Viburnum dilatatum is a first-class shrub of good habit, perfectly hardy and abundantly floriferous. It covers itself in the fall with dark scarlet fruit and is possessed of a whole catalogue of qualities not excelled by any other species. Native of the Orient, it is found in



Double-flowered Philadelphus, Albâtre

China, Korea and Japan, and is a bush sometimes 8 feet tall and more in diameter, with stout, ascending, pubescent branches and hairy obovate to oblong-obovate, coarsely toothed leaves. The very numerous flowers are borne in broad, flattened clusters, each from 2 to 5 inches in diameter. The flowers are all fertile, almost every blossom sets fruit, and the result in autumn is a mass of scarlet berries. The individual fruit is small and more or less oval, but so abundantly produced as to weigh down the bush. There is a variety (*xanthocarpum*) with pale yellow fruits, and remarkable as the only *Viburnum* outside the *Opulus* group in which fruit of this color is found.

Elaeagnus angustifolia, the so-called Russian Olive, is a useful tree especially for gardens near the sea. It grows some 20 to 25 feet tall and has one or several trunks which are studded with burr-like growths and clad with brown, fibrous bark which splits and shreds off. The leaves are lance-shaped, silvery gray and the tree is conspicuous from a distance. The flowers, produced several together from the axils of the current season's growth, are pale yellow, tubular, with reflexed lobes. These are followed in due season by ovoid, yellowish fruits, each about $\frac{1}{2}$ inch long. The tree flowers freely but it is the silvery gray foliage and rugged trunks that are most attractive. It is native of southern Europe and western Asia and has been in cultivation since the sixteenth century.

Cotoneaster salicifolia floccosa would appear to be the most satisfactory of the evergreen Cotoneasters that can be grown in Massachusetts. In the Arboretum it is a bush some 4 feet tall with many slender, ascending-spreading branches. The dark green, lance-shaped, leathery leaves, each from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches in length, are wrinkled above and covered on the under side with grayish white hairs. The flowers are pure white, borne in flattened clusters, each about 2 inches across, and when in blossom this shrub is as handsome as any *Spiraea*. The fruits, small and bright red, ripen late and are long retained on the bush. A native of western China, it was introduced by the Arboretum in 1908. It is a matter of some surprise that this handsome species should withstand the rigors of New England's climate. On Rhode Island and other places south it grows with greater freedom and rapidity, and in California it is now a favorite garden shrub.

Cornus kousa chinensis. Attention is again called to this magnificent plant, now at the height of its beauty on Bussey Hill. The bracts are pure white and when seen from a distance completely hide the foliage. Nearby the Chinese Dogwood some handsome plants of *Hydrangea xanthoneura* and its varieties, *Wilsonii* and *setchuenensis*, together with the closely related *H. Rothornii* are in full bloom, each shoot and branch terminating in a loose, broad, flattened-round cluster of white blossoms. These are hardy shrubs, native of western China, introduced by the Arboretum in 1908. E. H. W.

The Arboretum is served by the new Gray Line Motor Bus Service. Busses leave Park Square, corner of Boylston and Charles Streets, every half hour.

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Stewartia pseudocamellia is one of three species of these handsome trees common in Japan. They all agree in having polished, cinnamon-brown trunks and on this account are conspicuous among other trees of the forests. They have white Camellia-like flowers, each from 2 to 3 inches in diameter and a prominent mass of yellow stamens. As they flower in July, they have special value in gardens. Around Nikko and other mountainous parts of Japan, *S. pseudocamellia* is a common tree but it is scarce in gardens and difficult to purchase. When young the branches are ascending, forming a vase-shaped crown, but with age the tree becomes more or less round-topped. The leaves are oblong-lanceolate to obovate in shape and from 2 to 3½ inches long. The flowers are borne singly in the axils of the current season's growth. The bud is globular and looks like a small snowball among the leaves but as it expands its cupped, Camellia-like appearance is very noticeable. In the autumn the leaves turn to a blackish purple and are distinct in color from those of any other tree in the Arboretum. The two other Japanese species (*S. monadelphæ* and *S. serrata*) are found in the more southern districts. The first-named is characterized by having its styles united into one column and is a feature of the forests of Yakushima, where trees 80 feet tall and 12 feet in girth of trunk occur. The polished stems of this tree stand out in marked contrast to the rich dark green of *Cryptomeria*, Hemlock and Fir. Neither is hardy in the Arboretum. *S. sinensis* is a comparatively new species, native of central China but, unfortunately, not hardy in the Arboretum. This is a bush or small tree with flowers similar to those of *S. pseudocamellia* and remarkable for its very large, hairy fruit. It does very well in England and could be grown in parts of this country enjoying a climate milder than that of Massachusetts.

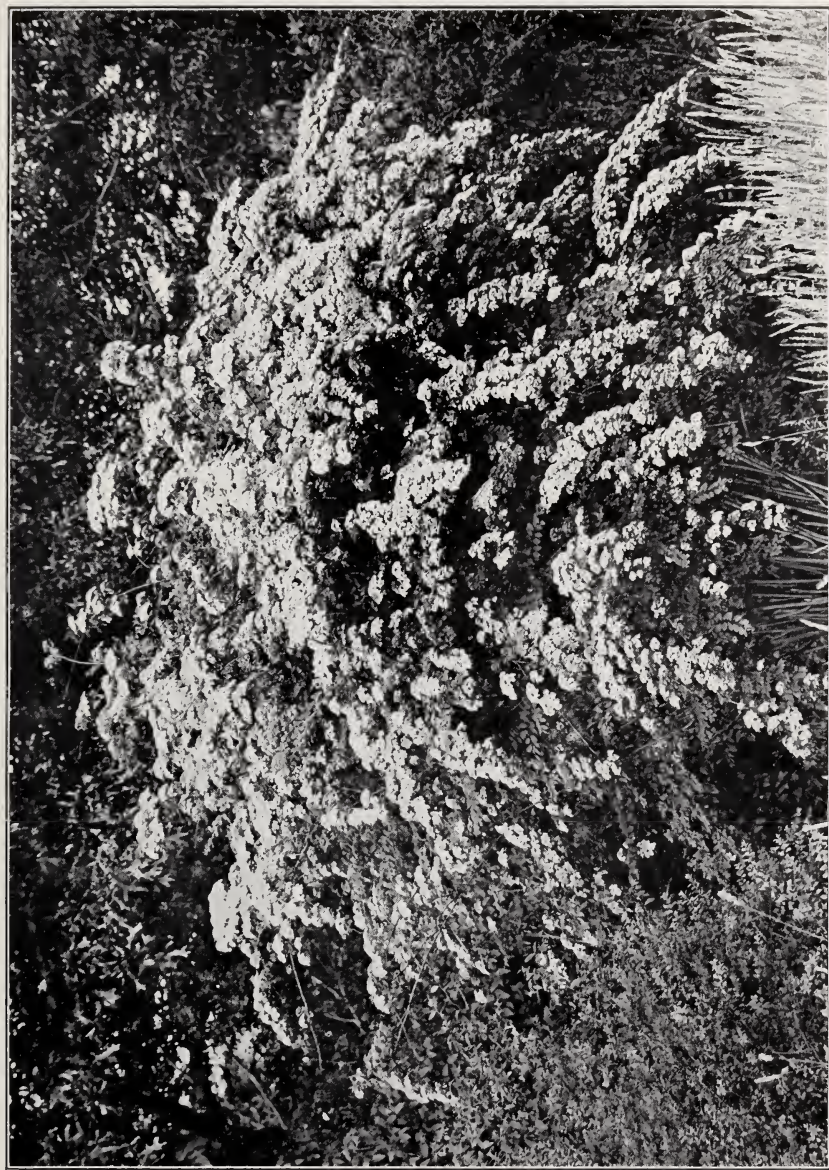
Stewartia koreana is a new and rare species found on Chiri-san and other mountains in south Korea. It is a smaller tree than *S. pseudocamellia* with broader, elliptic-ovate leaves and larger, flatter flowers. It was raised in the Arboretum from seeds collected by Wilson in 1917 and blossomed for the first time last year. It is perfectly hardy and promises to be a valuable flowering tree.

Stewartia pentagyna is an American species found from North Carolina to Florida. It is a shrub or tree-like bush with ovate to oblong-ovate leaves, each from 2 to 5 inches in length. The flowers are cup-shaped, 3 to 4½ inches across with concave petals and orange-colored anthers. More beautiful is its variety (*grandiflora*), which has purple stamens. The bright green leaves change in the autumn to orange and crimson. A second American species (*S. malacodendron*), also known as *S. virginica*, is, unfortunately, not hardy in the Arboretum. This species differs from *S. pentagyna* by having the styles united and by its smaller, differently shaped leaves. The species of *Stewartia* hardy in the Arboretum may be seen on Bussey Hill.

Ehretia thyrsoiflora is the only tree of the Borage family that is hardy in the Arboretum. It is native of southern Japan and eastern China and is a very interesting addition to the list of hardy trees. The specimens growing here were raised from seeds sent by Wilson in 1907 and may be seen on Bussey Hill and along the Centre Street Path. They are about 12 to 15 feet tall with spreading branches, polished, yellowish green shoots and petioles, and handsome, dark green, oblong-obovate leaves, each from 3 to 5 inches long and sharply serrated along the margins. The flowers superficially resemble those of the Privet (*Ligustrum*) and are borne in thyrsoid panicles, each from 4 to 6 inches long, at the end of the current season's shoots. In a wild state the panicked masses of flowers are often a foot in length. The flowers are small, white and give off an unpleasant odor. The fruit is small, shot-like and has no ornamental value. In China and Japan this is a tree 75 feet tall with gray, fissured, fibrous bark. It suckers somewhat and may be propagated by this means and also by root-cuttings.

Catalpa speciosa is now in blossom. This is a magnificent flowering tree native of the Mississippi Valley, where it is often more than 100 feet tall with a trunk 12 feet in girth. It has broad, heart-shaped, long-pointed leaves and terminal clusters of large blossoms. The Pentstemon-like corolla has fringed lobes and is more or less striped and dotted with brown-purple on the lower half and marked within the tube with yellow. For park and large garden this is an excellent tree but it has no place in the suburban lot and much less should it be used as a street tree, its disadvantages being that the leaves unfold late and fall early without any change of color, and for much of the year the tree is gaunt in appearance. This is the handsomest of a group of summer flowering trees, of which five species are growing in the Arboretum.

Magnolia virginiana, better known as *M. glauca*, the Sweetbay, is now in full bloom on the right just within the Jamaica Plain Gate. This is one of the most delightful of native trees with pure white, cupped blossoms, which emit a delightful odor and fill the air around with pleasant fragrance. It reaches its northern limits around the town of Magnolia in Massachusetts, where it is a deciduous shrub 10 to 12 feet tall. It extends near the coast southward to Florida and to Texas, where it is often a tree 60 and more feet tall and retains its leaves throughout the winter. It has been in cultivation for more than a



Late flowering and handsome *Spiraea Veitchii*

century but it is even now much too rarely seen in our gardens. The shoots are smooth, bright green and if bruised emit a spicy odor. The leaves are more or less elliptic to oblong-lanceolate, each from 3 to 5 inches in length, dark lustrous green on the upper surface, glaucous and clothed with soft, appressed silky hairs on the under side. The individual flowers are each from 2 to 3 inches in diameter, pure white and borne erect at the ends of the shoots. Often a second crop appears in late August and September. The fruit is small and ellipsoid and when ripe opens and exposes seeds clad in red jackets. Its flowers and foliage in summer, its fruit in autumn and cheerful apple-green shoots in winter, make this *Magnolia* ornamental the year round. It is readily raised from seeds and while not especially particular as to situation does best in a moist soil rich in vegetable humus.

Spiraea Veitchii is the last of its group to open its blossoms, and is the tallest and one of the handsomest of *Spiraeas*. It is a shapely, round-topped bush from 8 to 12 feet tall, with ascending-spreading stems. The individual flowers are small, but are crowded together in broad, rounded clusters, each from 3 to 5 inches in diameter, which terminate short, lateral shoots and often form arching sprays, each from 2 to 4 feet in length. The light green leaves vary from elliptic to elliptic-lanceolate and are smooth and quite entire. Native of the higher mountains of central China and introduced into cultivation by seeds collected by Wilson in 1901, it is perfectly hardy, and its late flowering qualities give it additional value. The odor of its flowers is reminiscent of Hawthorn blossoms. Fine plants may be seen in the Shrub Garden, on Bussey Hill and on Centre Street Path.

Rhododendron arborescens. Here and there about the Arboretum bushes of the Flame Azalea (*Rhododendron calendulaceum*) are still in bloom, but the species that is now beginning to make display is *R. arborescens*. This is another southern Appalachian Azalea found chiefly on the banks of mountain streams, ascending to an altitude of 5200 feet on the mountains of North Carolina. It is a plant of compact growth, forming a dense bush from 5 to 10 feet tall and about as much in diameter. The more or less oblong-lanceolate leaves, each from 2 to 4 inches in length, are dark, somewhat glossy green on the upper surface and glaucous beneath. The flower clusters, each of three to a dozen or more fragrant flowers, nestle among the leaves and terminate every shoot. The corolla, often pinkish in the bud, has a long, slender tube and five wide-spreading slightly reflexed lobes, pure white, often with a yellow blotch on the face of the upper corolla lobe. The long out-thrust stamens and pistil are crimson-pink and a pleasing feature. This is a very hardy species, valuable on account of its fragrance and of its late flowering qualities. On the western slopes of Bussey Hill there is a large planting and here and there by the roadside throughout the Arboretum isolated bushes of this Azalea at the moment make their presence known by their fragrance.

E. H. W.

A sketch map of the Arnold Arboretum free on application.

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Rhododendron maximum, the Great Laurel or Rose Bay, is the last of the true Rhododendrons to blossom in the Arboretum. This plant is found wild from Nova Scotia and the northern shores of Lake Erie, southward through New England and New York and along the Appalachian Mountains to northern Georgia, and is especially abundant on the mountains of western Pennsylvania and southward, covering the steep banks of streams to the elevation of 3000 feet. It grows to its largest size on the mountains of Tennessee and the Carolinas, there forming thickets hundreds of acres in extent and often impenetrable. It is a bushy, tree-like shrub, sometimes more than 30 feet tall, with stout stems and contorted branches, forming a rounded head. The short-petioled, more or less oblanceolate-oblong leaves are lustrous green on the upper surface, pale or grayish, sometimes rusty, on the lower surface, and each from 5 to 10 inches in length. The flowers are relatively small but are borne many together in a compact, pyramidal truss which is often much hidden among the leaves. They are pinkish in the bud and in the typical species the expanded corolla is more or less stained with pink. There is a variety (*album*) with pure white flowers. The honeyguide on the upper corolla lobe is greenish yellow, the stamens are markedly unequal in length and the anthers are often tinged with purple. The pedicels and peduncles are very glandular, a character which it has transmitted to its hybrid progeny. As a matter of fact, many of the so-called Catawbiense Hybrids are really hybrids of *R. maximum* and these may be distinguished by this glandular character. On account of the intense hardiness, handsome, evergreen foliage and late-flowering qualities, this Rhododendron is for northern gardens a very valuable plant. It is seen to best advantage when planted in open mixed woods, especially those clothing sloping, rocky ground.

Rhododendron maximum purpureum is more showy than the type. It came to the Arboretum in 1912 from the Cross Highways Nursery, Westport, Connecticut, under the name of *R. maximum superbum*. This variety has bright, rose-pink blossoms and brownish yellow honeyguides. The outside of the corolla is deep rose-color but within it is

flushed with white. The botanist, Frederick Pursh, first recognized this variety in 1814, giving its specific rank, stating that "It is found on the highest mountains of Virginia and Carolina near lakes." It is strange that a late flowering *Rhododendron* of so good a color should remain so rare in gardens.

Buddleia alternifolia has the distinction of being the only species of this very large genus that has leaves alternately arranged on the shoots. The leaves are narrow, oblong-lance-shaped, very short-stalked, dull green above and gray on the underside. The flowers are lavender-purple with a reddish crimson eye and are borne many together in compact rounded clusters from the axils of the leaves of the previous year's shoot, and, later in the year, in those of the current season. The flower clusters are freely produced and often shoots 3 to 4 feet in length are knotted, as it were, with bunches of blossoms. Native of northwestern China, it was introduced into cultivation through seeds collected in southeastern Kansu by Messrs. Farrer and Purdom in 1914. The plants in the Arboretum were raised in 1923 from seeds received partly from the Royal Horticultural Society's Gardens at Wisley and from the Edinburg Botanic Gardens. It is the hardiest member of the family and by blooming at high summer and continuing into the fall it is a valuable mid-season plant. Like its relative, *B. Davidii*, it is easily propagated from cuttings of half ripe wood. When properly known it is destined to be a favorite garden shrub. A handsome bush may be seen in full blossom on Bussey Hill.

Schizophragma hydrangeoides. This uncouth name has been known to nurserymen and gardeners for at least three quarters of a century but the plant to which the name actually belongs is still scarcely known outside a few botanic gardens. Under this name, two root-climbing Japanese plants were confused in gardens. For a long time the name was used for the plant which we now know as *Hydrangea petiolaris*. Indeed, it was not until early in the twentieth century, when the true *Schizophragma hydrangeoides* blossomed for the first time under cultivation, that the confusion existing began to be straightened out. Although in a general way similar, the two plants are really very distinct and when seen growing side by side even in leaf, much more in flower, the distinctions are obvious. In the *Hydrangea* the leaves are relatively thin, bright green with finely serrated margins; the flower cluster on its outer circumference bears 4-partite conspicuous blossoms; the fruit opens at the top and the seed is minute and not winged. In the *Schizophragma* the leaves are relatively thick, dull green, pale on the under surface and coarsely toothed; the flower cluster is furnished with numerous white, ovate bracts, the fruit opens down the sides and the seeds are winged. The *Hydrangea* is the earlier to open its blossoms. Both are valuable root-climbing plants but the *Schizophragma* is the more beautiful of the two. Its flowers open later and the numerous white bracts retain their color for a long period, changing finally to pink and brown. This *Schizophragma* is not so common a plant as the Climbing *Hydrangea*, neither does it grow so vigorously, nor is it quite so hardy. However, on the northerly wall of the Administration Building a magnificent plant may now be seen in full flower.



Schizophragma hydrangeoides

In China there is a species (*S. integrifolium*) with larger flower trusses but, unfortunately, this has not proved hardy in the Arboretum. It does well in France, notably around Paris, and in certain parts of the British Isles.

Elaeagnus longipes on the bank at the upper end of the Lilac Collection is now beautifully in fruit. This is a broad shrub with spreading branches laden with ovoid, cherry-like fruits, each suspended on a long, slender stalk. They are orange to bright red in color and close inspection shows them to be covered with wart-like dots. The leaves are short-stalked, more or less elliptic-ovate, with a blunt point and silvery on the under surface. This is the earliest to fruit of a useful group of shrubs, chiefly oriental, of which some half dozen species are growing in the Arboretum.

Cornus dubia is a supposed hybrid raised in the Arboretum from seeds of *C. paucinervis*. It is a densely branched shrub of good habit some 5 feet tall and more in diameter, clothed with dark to lustrous green, lanceolate leaves with the veins strongly impressed on the upper surface and prominent on the lower. It bears flat clusters each from 2 to 3 inches in diameter, of small white blossoms with prominent stamens. The flowers are sweetly fragrant and are followed by deep blue, changing to black, fruits. This and its presumed parents, *C. paucinervis* and *C. amomum*, are the last of the Cornels to blossom. The first to bloom is, of course, the Cornelian Cherry (*C. mas*), which opens its blossoms early in April, and from then on the whole group has a flowering period covering three and a half months. In flower and fruit the Dogwoods form one of the most useful groups of shrubs or lesser trees that the gardens of northeastern North America enjoy.

Leptodermus oblonga is again flowering on Centre Street Path. A low, twiggy plant, almost a subshrub, it is never more than 2 feet high, and has small, dark green, oblong leaves and bears a profusion of blossoms clustered at the end of branch and branchlet. The flowers are of a pleasing wine-purple color, tubular, with five spreading lobes. It is an exceedingly floriferous plant, which is well adapted for growing in rockeries. It is native of northern China, from whence it was introduced by the Arnold Arboretum through seeds collected by Mr. J. G. Jack in 1905. This subshrub with the Buttonbush (*Cephalanthus occidentalis*) and the Partridge-berry (*Mitchella repens*) are the only members of the great family of Rubiaceae which are hardy in the Arboretum.

Berberis aggregata. Among the wealth of Barberries that are hardy in Massachusetts this and its relatives form an interesting group, for they flower after midsummer. They all agree in having rich green, more or less blunt, oblong-lanceolate leaves and terminal masses of deep yellow flowers, which are followed by clusters of small, round, salmon-red fruits. In *B. aggregata* the flower cluster is dense, in the variety (*Prattii*) it is looser and more paniculate. In *B. polyantha*, which is the handsomest of the group, the flowers are in loose, more or less spreading or hanging, panicle clusters.

E. H. W.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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The wet season has been favorable to tree and bush and the foliage was never richer in appearance than at the moment. Weeds are hard to control but the lush growth on tree and shrub and vine is good to behold. The Arboretum's flowering season is nearing its close. Some of the mid-season trees are at the height of their beauty and the late-flowering Spiraeas and Sorbarias are in blossom. So, too, is the fragrant *Azalea viscosa*, last of its tribe to flower. The earliest of the Pepperbushes (*Clethra barbinervis*) is in bloom on the Overlook, and in the Shrub Garden the Hypericums are opening their handsome yellow blossoms. There are flowers on a variety of other shrubs, but the display for the year is over. On the Honeysuckles blue-black, red or yellow berries according to variety may be seen and some of the Dogwoods are also ripening their fruits.

Maackia amurensis is flowering very abundantly this season. In the Arboretum the best tree is about 30 feet high with a trunk 1 foot in diameter, but in a wild state it is often 60 feet tall. It has dark green, pinnate leaves which fall in the autumn without much change of color. The flowers are borne in erect, cylindric racemes, which, branching at the base, form candelabra-like masses. The individual flowers are cream-colored, pea-shaped with a much swollen calyx; the standard is strongly recurved and greenish, while the keel opens to display orange red anthers. The fruit is a dry, thin pod and possesses no ornamental qualities. Unusually handsome this year is the variety *Buergeri*, which differs in having the leaflets hairy on the underside. Specimen trees of these and of the Chinese species may be seen in blossom on the right of Bussey Hill Road, facing the Lilacs.

Maackia chinensis is a comparatively new species native of central China from whence it was introduced into cultivation by seeds collected by Wilson in 1907. In size, habit of growth and general appearance it closely resembles the better-known *M. amurensis*, but it has narrower and more numerous leaflets and a larger, more branched panicle head of flowers. The individual flower is also whiter and more conspicuous. The only other species growing in the Arboretum is *M. Fauriei*,

which is native of southern Korea. *Maackia* is an oriental genus, consisting of six known species which occur in Japan, Korea, Liukiu Islands and China, and is closely related to *Cladrastis* of which the Yellow-wood (*C. tinctoria*) is the best known member. In *Maackia* the buds are prominent in axils of each leaf, whereas in *Cladrastis* the bud is hidden within the sheathing base of the petiole. There are other differences but this is a rough and ready means of distinguishing the two genera. The different species are strikingly handsome when the leaves begin to unfold on account of the dense, silvery gray pubescence clothing them. The bark is smooth and the heart-wood of the tree is ebony-like and in the Orient is used for making small ornaments.

Sophora japonica was one of the first trees of the Orient to be introduced into cultivation, having been sent to France so long ago as 1747. It is much cultivated in the Far East, being usually associated with Buddhist temples and other religious sanctuaries, but its real home is northern China. It is well known in gardens and valuable on account of its late-flowering qualities. Moreover, it seems to withstand city conditions better than the average tree as specimens in the Public Garden, Boston, Massachusetts, well demonstrate. The leaves are pinnate, dark green above, gray on the underside, and the bark is deeply fissured and corrugated. Old trees have much the appearance of the White Ash. The flowers, which appear in early August, are cream-colored and borne in large, erect, much-branched panicles at the end of every shoot and are followed by slender, jointed pods which, if crushed, are soapy to the touch. In the Orient trees 80 feet tall, with a trunk 12 feet in girth and an abundance of gnarled, wide-spreading roots are frequently to be seen. There are several horticultural varieties, the most distinct being that with pendent, crowded branches (*pendula*). Grafted high as a standard this makes a picturesque tree.

Koelreuteria paniculata is one of the handsomest flowering trees hardy in New England and, except the Laburnum, the only tree with yellow blossoms that can be grown in the Arboretum. It is a flat-topped tree, seldom 40 feet high but with a crown more than this in diameter, and dark green, pinnate leaves with incised leaflets. The flowers are borne in enormous compound, paniculate masses at the end of every shoot. They are similar in shape to those of the Horsechestnut, but are clear yellow in color with prominent orange-red markings at the base of the petals. The fruit is top-shaped and bladder-like; at first white it ultimately changes to pink and brown. Native of northern China, this tree was brought into cultivation more than a century and a half ago but is by no means as widely grown as its merits deserve. Like *Sophora japonica* it thrives in town gardens and parks better than a majority of trees and on this account is doubly valuable. It is easily raised from seed and there is no reason why it should not be readily obtainable. The trees on the right of Meadow Road are now laden with conspicuous, rich yellow blossoms.

Oxydendrum arboreum, the Sorrel-tree or Sourwood, is one of the few tree members of the great family to which belong the Rhododendrons, Kalmias, Ericas, Vacciniums and other familiar plants. Native of the



The Umbrella Pine (*Sciadopitys verticillata*)

southeastern United States, it is a tree from 30 to 50 feet tall with a straight trunk clothed with dark gray, furrowed bark. The pointed leaves are oblong-lance-shaped, finely serrated along the margins, bright green on both surfaces and have a pleasant acidulous taste, from which character the tree derives its generic name. The urn-shaped flowers, borne in loose, spreading panicles at the end of every shoot, commence to open towards the end of July. As the corollas wither, dry, white fruits simulating the flowers in appearance speedily form and remain attractive late into the fall. Among native trees none assume more brilliant autumn tints of orange and crimson, and from the time the flower buds appear in mid-July until the leaves fall in late October the Sourwood is decidedly ornamental. A group of these trees just bursting into blossom may be seen among the *Kalmias*, bordering Hemlock Hill Road.

Sciadopitys verticillata, the Japanese Umbrella Pine, is among the most notable Conifers that can be grown in the climate of Massachusetts. It is of dense, pyramidal habit with ascending-spreading branches. The leaves are borne in clusters around the stem, one tier above another, suggesting a parasol, hence its common name. They unfold bright green but soon change to black-green and remain so throughout the winter. The strap-shaped leaves, each from 3 to 4 inches long, are thick and leathery in texture with a white line on the under side. It likes a cool situation and good soil and would appear to thrive better in New England than in the British Isles. There are several fine specimens in the Juniper Dell but larger ones may be seen here and there in Massachusetts, notably in Newburyport. By the old regime in Japan, this was one of the seven famous trees, the illegitimate felling of which was a capital offence. The wood is white, fragrant, very durable in water, and is much used in Japan for making bathtubs and small boats. Like certain other trees it does not grow old gracefully, and in the adult tree with its narrow, often spear-shaped, crown it is hard to recognize the stately ornamental plant we know in gardens. A monotype, it is confined mainly to the mountains of central Japan, being very abundant on Koyasan, a mountain not far distant from the ancient capital of Nara. The Umbrella Pine is easily raised from seeds but grows slowly. No other form of propagation is known, but on account of its great hardiness and distinct appearance nurserymen ought to raise it in quantity. It was one of the plants introduced into America by Dr. G. R. Hall in 1862.

Sphaeralcea remota is a relative of the Hollyhock and Hibiscus and a very rare American plant, being known only from Alton Island in the Kankakee River, Illinois. It is suffruticose in habit and the stems die down to the ground each year. The leaves are similar to those of a Hollyhock in shape but thinner in texture with more pointed lobes. The flowers are short-stalked and freely produced from the axils of every leaf. They are lavender-pink in color, somewhat saucer-shaped, with four or five petals. This plant is now in blossom on Centre Street Path and on account of its mid-season flowering qualities has a decided use in gardens.

E. H. W.

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Now is a good time to visit the Arboretum; the foliage on tree and bush and vine is assuming brilliant autumn tints and fruits of all colors hang from the branches. The Viburnums, Spindle-trees and Crabapples in particular, are laden with a wealth of brightly colored fruits. Everywhere at this season of the year tinted autumn foliage is the feature of the landscape but in the Arboretum, where every northern land has been laid under contribution, the range of color is greater than that of America's woodlands.

The *Viburnum* tribe is widely distributed throughout the northern hemisphere. More than 120 species are recognized, of which 15 are native of eastern North America. As a group Viburnums are of great horticultural value, some of the members ranking among the most useful of garden shrubs. A great many are ornamental not only in flower but also in fruit which varies in color from yellow through varying shades of red and crimson to rich blue and black. No species native of this country other than *V. trilobum*, better known as *V. americanum*, and *V. pauciflorum*, which belong to the *Opulus* section, has red fruit. Indeed, all the red-fruited species outside of the *Opulus* group are native of the Orient. Two or three valuable species are confined to Japan and Korea but central and western China, since the dawn of this century, has given us a dozen Viburnums with red-colored fruits. These have peculiar interest to all who value shrubs for their brightly colored autumn fruits and, moreover, almost without exception they have handsome autumn tinted foliage. Altogether this group deserves far greater attention from nurserymen, landscape architects and garden lovers than at present it enjoys.

Viburnum theiferum is not only a very distinct shrub but in fruit it is probably the handsomest of all the Chinese species. It is a plant of tall growth with stout, erect stems and horizontally disposed branches. The leaves are rather thick and fleshy, smooth on both surfaces, ovate-lanceolate to oblong-ovate, shortly stalked and slightly hanging. The fruit is ovoid, remarkably large, and is produced in quantities in hanging, flattened clusters. In the typical form the fruit is scarlet, in an-

other it is orange-red, a color unique in the whole family. On Mt. Omei, a sacred mountain in western China, the Buddhist monks collect the leaves and make an infusion known as Sweet Tea which they sell to pilgrims at much profit. The plant owes its specific name to this use but in gardens it will be valued for its brilliantly colored fruits produced in royal profusion and lasting from mid-September until the end of October. A fine specimen may be seen on Bussey Hill.

Viburnum lobophyllum is a bush some 6 to 8 feet tall with stout, ascending stems and broad ovate to roundish, pointed leaves, almost, if not quite, glabrous at maturity, coarsely toothed along the margin and with veins deeply impressed. The ripe fruit is bright scarlet, borne many together in flattened round, 3 to 4 inch broad clusters. The young shoots are clothed with a waxy bloom and the winter buds are hairy and stout. The fruit is larger than that of any other globose-fruited *Viburnum* and hang in clusters which weigh down the branches. Although the leaves fall with little or no change in color the plant throughout the latter half of September until mid-October is a striking object. It is a native of central China from whence it was introduced by Wilson in 1907 through seeds sent to the Arboretum. Very similar is *V. betulifolium*, also from central China, which, however, has smaller leaves and fruits and glabrous winter buds. A third related species is *V. hupehense*, a rounded shrub with ascending-spreading stems 5 to 8 feet tall. The oblong-ovate to ovate or obovate leaves are hairy on both surfaces and in the autumn assume a dull blackish purple color. The fruit is globose, about the size of a small pea, vivid scarlet, borne abundantly in short-stalked, flattened clusters each from 2 to 3 inches in diameter. A Japanese species also found in Korea is *V. erosum*, a twiggy bush of compact habit which seldom exceeds 5 feet in height. The leaves, ovate-lanceolate and shortly stalked, are rough to the touch and the fruit is small, globose and bright red. Neither this nor the closely related *V. ichangense* is of particular garden merit.

Viburnum Wrightii. Since quite early in September this has been one of the most strikingly beautiful fruiting shrubs in the Arboretum and will remain so until severe frosts set in. It is a native of Japan and although introduced into cultivation more than a quarter of a century ago is rarely seen in gardens. Its moderately stout stems are ascending and spreading forming a loose, roundish bush some 5 feet tall and from 6 to 8 feet through. The leaves are shortly stalked, broadly ovate, often roundish, and assume dark wine-purple tints before they fall. The fruit is globose, lustrous scarlet, densely crowded in short-stalked flattened corymbs each from 3 to 5 inches in diameter. So heavy is the fruit and so abundantly produced that it weighs the branches down to the ground. This Japanese species is also remarkable for the length of time it retains its fruit and foliage in good condition.

Viburnum dilatatum is a sturdy shrub with ascending-spreading branches forming a compact, more or less flat-topped bush from 6 to 9 feet tall and more in width. The branchlets are stout and each and



Most beautiful in fruit, *Malus toringoides*.

every one terminates in a 4 to 5 inch broad, flattened cluster of ovoid brilliant red fruits, lustrous and sparkling in the sunshine. The fruits are small, abundantly produced and crown the whole bush in vivid color. The leaves are hairy, coarsely toothed more or less ovate, and assume vinous purple tints before they fall in late October; on some bushes the foliage is a rich bronze. There is a variety (*xanthocarpum*) with fruits exactly the color of old ivory and, if not so striking a subject as the type, is interesting as being the only yellow-fruited variety of *Viburnum* known outside the *Opulus* group. This and the others mentioned may be seen in fruit in the *Viburnum* collection just on the left entering from Centre Street Gate, almost facing the junction of Bussey Hill and Valley roads.

Malus toringoides. All the Crabapples are ornamental; some of them are especially valued for their flowers, some for their fruit and some for both qualities. For fruit alone *Malus toringoides* is probably the handsomest of the whole tribe, even as it is one of the most distinct. The fruits are waxen in appearance, rosy red for the most part but yellowish on the side away from the light. They are pear-shaped, each about five-eighths of an inch long and half an inch broad and produced in nearly sessile clusters, each fruit pendent on a slender stalk. It is a tree possessed of much character, being Thorn-like in habit with intricately placed branches which when laden with fruit hang downward, the whole forming a broad, irregular, more or less ovoid mass. The leaves are sharp-pointed, deeply incised and not at all unlike those of the European Hawthorn. The flowers are pure white and less attractive than those of many other species but from mid-September until late October when laden with myriad fruits no other Crabapple is more attractive. It is a native of the Chino-Thibetan borderland from whence it was introduced by seeds collected by Wilson in 1904. Some admirers have dubbed it Wilson's Crabapple and the discoverer is well pleased with the compliment. In a wild state this is a small tree of irregular habit, seldom exceeding 15 feet in height and breadth, but under cultivation it promises to exceed these dimensions. A fine specimen may be seen on Bussey Hill and another in the Crabapple collection at the foot of Peters Hill. To those fond of a beautiful fruiting tree the sight of either one of these plants is well worth a journey to the Arboretum. It is a good species and unlike most of the family comes true from seed.

Berberis amurensis. The Barberries in general are bearing little fruit this season, due probably to heavy rains when they were in blossom. The Amur Barberry, however, is as full as ever. Indeed, this most handsome species appears to be a never failing cropper. Related to the common Barberry (*B. vulgaris*), this plant is abundant in the colder parts of northeastern Asia, and it is represented in Japan by its variety *japonica*, often called *B. Regeliana*, which differs chiefly in its broader, more densely serrulate leaves and smaller flower clusters. The Amur Barberry is an upstanding bush 8 to 12 feet tall and more in diameter, dome-shaped and dense. The fruits are racemose, ellipsoid, bright red covered with a slight glaucous bloom. It is one of the hardiest and handsomest of the whole Barberry clan. E. H. W.

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Pinus is the largest genus of coniferous trees and the one with which people of the northern hemisphere are most familiar. The long, slender, needle-like, gray or dark green leaves arranged in bundles of two or more, according to species, and the woody, usually long persistent cones are characters which distinguish them from all other trees. Their appearance is so distinct that the least observant has no difficulty in recognizing a Pine tree. The genus is essentially northern. In this country it is distributed from the Arctic Circle south to the West Indies and Guatemala. In the Old World species of Pine are known from the Arctic Circle south to the Canary Islands, northern Africa, Himalayas, Burmah, and the Philippine Islands and one species crosses the Equator to Sumatra. In all some 80 species are known, the greatest number being native of western North America including Mexico.

Pine trees grow from sea-level to high up on the mountains. They are social trees and form more or less pure woods or forests of vast extent. Often, however, they are associated with other Conifers and broad-leaved trees. The genus contains some of the most important timber trees of the world and in the temperate regions wherever trees are planted either for ornamental or for forestry purposes members of the Pine tribe are in request. In South Africa, in Australia, and in New Zealand, where no species of Pine is indigenous, millions have been planted. Of the species employed the Californian *P. radiata* is the most useful; indeed, it promises to be the greatest tree gift the north has contributed to the southern hemisphere.

In the Arboretum some 30 species and 38 varieties of *Pinus* are growing and about half this number of species may be said to thrive. They are all to be found in the Pinetum, which is well worth a visit at any season of the year but especially during the autumn and winter months. Of the 30 species 7 are natives of northeastern North America, 9 of western North America, 8 of the Far East, 1 of the Himalayas, and 5 of Europe. The varieties are mostly sports which exhibit different types of growth. Some of these have been found in a wild state but the majority have appeared in gardens where Pine trees have been raised from seeds over a long period. These curious forms must be perpetuated by grafting, but for the

species the best and, indeed, the only practical way of raising Pine trees is from seeds.

Eastern North American Species. Of these the best and most beautiful is the White Pine (*P. strobus*), one of the commonest and most valuable of native trees. No lengthy description is necessary since it is known to all who love American trees. Its leaves are gray with silvery lines, slender, and arranged in bundles of five. The branches spread more or less horizontally to form a pyramidal crown, the leaves hanging somewhat give the tree a graceful outline. For planting as specimens, as forest trees or as shelter belts the White Pine is for eastern North America the most valuable Pine tree, the threat of blister rust notwithstanding. It is the most valuable timber tree of northeastern North America and has played a conspicuous part in the material development of the country. The vast forests which formerly existed have been felled and the great trees, once the pride of the northern forests, no longer exist. However, it is still plentiful, regenerates readily in open country, and the sylvan landscapes of New England owe much of their peculiar charm to the widespreading, gray-green crowns of this tree.

There are several varieties of the White Pine in cultivation, the most useful being *nana* and *fastigiata*. The dwarf form (*nana*) makes a broad, more or less round-topped bush of dense habit, seldom more than 6 feet tall but twice that in diameter. Distinct and decidedly ornamental is the variety *fastigiata*, which has ascending stems forming a columnar crown, the loose arrangement of its foliage taking away the stiffness so usual in upright-growing trees. Another excellent species is *P. resinosa*, the Red or Norway Pine, so named for a small village in Maine where once this tree was abundant. This is a handsome tree sometimes 80 feet tall with a straight trunk clothed with light, reddish brown, rather thick bark. The leaves, two in a sheath, are long but the branching of the tree is light and open. For ornamental purposes in eastern North America it is comparable with, but superior to the Austrian Pine. The Jack Pine (*P. banksiana*) and the Jersey Pine (*P. virginiana*) can be recommended for planting on rocky waste lands. They are similar in habit of growth but the cones are quite distinct. In the Jack Pine it is oblong, points toward the apex of the branch and remains closed for many years. In the Jersey Pine the cone scales open at maturity. In the Arboretum this species has naturalized itself. The Pitch Pine (*P. rigida*) is an unlovely tree, readily recognized by the presence of green sprouts on the trunk. Except that it will grow where lashed by the sea, it has little garden value. The other two species, *P. pungens*, the Hickory Pine of the Appalachian Mountains, and *P. echinata*, the Short-leaved Pine, barely exist in the Arboretum.

Western North American Species. The best of these is *P. monticola*, the White Pine of the Rocky Mountains. In many respects this resembles *P. strobus* but has thicker leaves which give the crown a heavier appearance. It grows more slowly than its eastern relative, which is the more ornamental species. *P. ponderosa*, the Yellow or Bull Pine, grows quite well in the Arboretum, its long, dark



Upright White Pine (*Pinus strobus fastigiata*)

green, thick foliage giving it, as its specific name indicates, a ponderous appearance. There is a form with hanging branches known as *pendula*, which has a distinct place in the garden. The variety *Jeffreyi* is one of the few Pacific coast Pines that thrive here. The Sugar Pine (*P. Lambertiana*) grows very slowly and gives no promise of ever becoming a useful ornamental tree. The Limber Pine (*P. flexilis*), although of slow growth, is perfectly hardy and happy in the Arboretum. Its relatively long, plume-like branches give it a characteristic appearance. The related *P. aristata* and *P. Balfouriana*, the Foxtail Pines, do poorly.

Far Eastern Species. The Japanese White Pine (*P. parviflora*) and the Korean Nut Pine (*P. koraiensis*) do well in the Arboretum. In Japan the first named is often grafted on *P. Thunbergii*, the result being a stunted, short-needled plant of value only for Japanese gardens. Raised from seeds, it is a free growing tree with wide-spreading, rather rigid and stiff branches. The Korean Nut Pine for eastern North America is better than the Swiss Pine (*P. cembra*) which it strongly resembles. It grows faster and its dark and thick needles give it a very handsome appearance. This is the best of the Oriental Pines from the point of view of its timber. The Red Pine of Japan (*P. densiflora*) is also quite at home in eastern North America. It has short grey-green needles and reddish brown bark. The Black Pine (*P. Thunbergii*) with thick black-green leaves and large pure white winter buds is excellent for planting by the sea. Its branches are apt to grow crookedly and the tree assumes the appearance one is familiar with in Japanese paintings and embroideries. The White Pine of China (*P. Armandi*) and the Bhotan Pine (*P. excelsa*) suffer from boring insects and neither promise to make trees in the Arboretum.

European Species. Of these, three with numerous varieties do very well in Massachusetts. The Austrian Pine (*P. nigra*) and its several varieties grow rapidly and with their dense, rather heavy, black-green foliage are decidedly ornamental. They withstand spray and strong gales well and for seashore gardens and windbreaks this species and its forms have great value. The Mountain Pine of central Europe (*P. mugo*) is one of the most useful dwarf Pines for garden purposes that can be grown in eastern North America. Its dark foliage and compact habit make it most adaptable for small gardens and for foundation plantings. Of the several varieties, *compacta*, *mughus* and *pumilio* are the best known. All are well worthwhile. The Macedonian Pine (*P. peuce*) grows slowly and does not promise to be of much ornamental value. The Scots Pine (*P. sylvestris*), perhaps the most useful of all the European species, is not a success in eastern North America; it grows rapidly when young but after about twenty years becomes stunted and subject to insect attacks and fungous diseases. No one Pine has been more abundantly planted in this part of the world, and it is more than probable that many will rue the day they set it out in expectation of its value as a timber producing tree.

E. H. W.

These Bulletins will now be discontinued until April of next year.

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